

Indo-European and the Indo-Europeans

A Reconstruction and Historical Analysis
of a Proto-Language and a Proto-Culture

Part I
The Text

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To the memory of our teachers:

Mixail Nikolaevič Peterson (1885-1962)

Georgi Axvlediani (1887-1973)

Georgi Cereteli (1904-1973)

Authors' Preface

The second half of the twentieth century has been marked, in the history of linguistics, by a growth of interest in problems of diachronic linguistics, motivated by the general evolution of linguistic thought in recent decades. Overcoming the Saussurean antinomy of diachrony and synchrony, linguistic science is moving toward a theory with greater explanatory power than purely taxonomic synchronic grammar offers.

The growth of interest in diachronic linguistics has fostered a return to questions that arose in classical Indo-European comparative-historical linguistics, questions that can be posed more clearly now with the aid of new methods of linguistic description developed by various trends in synchronic linguistics and by linguistic typology. Typology is particularly important to contemporary linguistics because it makes it possible to reveal the universal linguistic categories that characterize the deep structures of language, and also to determine the degree of diversification between various language systems. Furthermore, language is a social phenomenon and a part of human culture and therefore closely connected to other aspects of culture. Therefore, both synchronically and diachronically language must be studied together with the other aspects of culture that make up the subject matter of modern cultural anthropology.

This book presents the results of our joint comparative research into the Indo-European languages and the reconstruction of Proto-Indo-European that gave rise to the attested Indo-European languages. Indo-European is studied in this approach in typological comparison to other languages, in particular the geographically adjacent ones with which Proto-Indo-European must have interacted for a long period of time.

The first part of the book presents the results of linguistic analysis — phonological, morphological, syntactic, and areal-dialectological — of Proto-Indo-European. This does not mean that the analysis should be viewed as a systematic survey of the various branches of comparative Indo-European grammar, as is done in the standard handbooks. Rather, the first part is a study of key questions of Proto-Indo-European structure, involving a wide range of facts and yielding a relatively complete picture of this language in its dynamic development and its typological links to other language systems.

The second part gives a relatively full investigation of the Proto-Indo-European lexicon, presented by semantic groups, as well as fragments of Indo-European culture that can be reconstructed from the lexicon; it also describes the culture-historical links of the Indo-European lexicon to a number of languages of ancient Eurasia. This is properly a dictionary of Proto-Indo-

European lexemes presented not in alphabetical order (that can be found in the indexes) but in order of semantic groupings. In contrast to the well-known Indo-European dictionary of Pokorny, in our semantic dictionary each entry presents not only the formal correspondences between cognates which make possible the reconstruction of a protoform, but also the phenomena of material and intellectual culture that are connected with the root in the individual daughter traditions. On this basis a reconstruction is then given for the Proto-Indo-European level.

The final section presents the results of research into the linguistic and culture-historical data relevant to determining the Indo-European homeland and the migratory routes taken by the Indo-European tribes across the Eurasian continent to their historically attested locations.

The range of questions surveyed here should be of interest not only to linguists but also to historians, archeologists, anthropologists, and historians of culture. Given the specialized nature of some parts of the book, especially its linguistic parts, readers may wish to read chapters in various orders depending on their interests. The second part of the book, where culture-historical problems are analyzed from a linguistic perspective, and the final section on migrations can be read without reading the first part (except where explicit cross-references are made). The final section, on migrations, is essentially self-standing and can be read without the others, although the semantic dictionary will be useful for more detailed understanding of the histories of the individual words that support the historical arguments in the final section.

Linguists, on the other hand, may wish to read only the first part and skip the factual details of the second part. Still, the two parts are organically linked, as will be evident, and this is why they are covered by joint indexes. These can be used as a guide or word index by readers interested in particular questions discussed in the book.

The book is the result of joint research begun in 1970. It was produced not by assembling separate chapters written individually by one or the other author, but jointly, by laying out together the conclusions and results of many years of collaborative research that involved joint analysis of particular problems and joint formulations of results.

Throughout the time when the research was being done and the book written, publications have appeared that have been consistent with our claims. Insofar as possible we have taken these into account in the text and bibliography, in the conviction that the sheer quantity of agreement is the strongest confirmation of our analysis. The most recent literature, especially works that appeared in 1983, could generally be taken into consideration only in the Afterword, which surveys some works that directly address or respond to our claims (see also the section entitled 'Addenda and corrigenda' in the Russian original, pp. 1317ff.).

We are pleased to express our gratitude to those who have been involved in

one way or another in discussing and responding to earlier presentations of this work in seminars and reports. We are grateful, first of all, to our teachers, the late G. S. Axvlediani and G. V. Cereteli, for their constant interest in our work in its early stages, and also to V. I. Abaev, A. A. Zaliznjak, V. N. Toporov, T. E. Gudava, I. M. Diakonoff, I. M. Steblin-Kamenskij, S. D. Kacnel'son, and G. V. Stepanov. Among foreign scholars we thank J. H. Greenberg, M. Mayrhofer, O. Szemerényi, C. Watkins, J. Catford, W. P. Lehmann, E. Polomé, E. Hamp, H. Pilch, W. Winter, E. Risch, R. Schmitt-Brandt, A. H. Kuipers, H. Hoenigswald, A. Kammenhuber, A. Morpurgo Davies, M. Gimbutas, W. Cowgill, H. Bimbaum, R. Anttila, R. Austerlitz, K. Strunk, R. Schmitt, K. H. Schmidt, H. Aronson, J. Greppin, J. Nichols.

We should make special note of the extent to which we are indebted to Roman Jakobson — one of the greatest scholars of our times, one of the founders of contemporary linguistics, and the source of many of the ideas that this book is based on. During our work on the book we discussed with him our results and various problems that arose, and this greatly facilitated our analysis and exposition. His constant participation in our work is reflected in his foreword to this book, written when we had completed the manuscript. This foreword is one of his last pieces of writing.

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Tbilisi — Cavkisi — Peredelkino — Moscow
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Foreword

Among the favorite themes and main tasks of linguistics from the last century to the early years of this one were questions of the reconstruction of Proto-Indo-European, and in the world's universities the chief, and usually the only, linguistics department was a department of comparative Indo-European linguistics. It was that epoch whose efforts are summed up in the classic handbooks, efforts directed at revealing the diverse particulars of the common protolanguage underlying the genetically related members of what is known as the Indo-European linguistic family.

During the course of the twentieth century a change in the basic mission of linguistics has made itself felt — on the one hand in the increasing frequency with which technical means and methods developed in Indo-European linguistics were applied to other language families in both the Old and the New World, on the other hand in an increased enthusiasm for the strictly descriptive approach to individual languages without historical comparison either to earlier stages of that language or to related languages. These two spheres of research interests inevitably led to verification and critical reassessment of the inherited methodology.

On the one hand, comparative-historical inquiries concerning the ancestors and interrelationships of various language families deepened and enriched the problematics of linguistic reconstruction, while on the other it was descriptive linguistics that raised fundamental questions about the linguistic system and its regular structure, and in particular laid the groundwork for systematic inquiry into the relation of sound structure and meaning.

A process of integration naturally arises between the expansion of comparative-historical problematics and the commitment of descriptive linguistics to the discovery of systematic structure: the necessity of restricting the tasks of comparative linguistics to strictly genetic comparison falls away, while questions of systematic structure finally go beyond the bounds of descriptive linguistics and find welcome application to the historical past of attested and reconstructed languages.

The first step in this process is to acknowledge the inseparability of the regular system and its changes, which are also regular. The limits of linguistic comparison shift considerably, and new tasks accrue to the study of the general patrimony of linguistic families. The commonalities acquired by the phonological and grammatical structures of languages that are spatially adjacent and enter into areal relations can now be explained. Then there arises the possibility and even the necessity of comparing different linguistic (and chiefly phonological) systems without regard to their genetic or geographical closeness.

As a consequence of the comparative analysis of all these linguistic systems, systematic typological classification grounded on rational principles is now

feasible. In these efforts the facts of living languages, supported by documentation of historical languages, make it possible to check the plausibility of proto-systems reconstructed by the comparative method, and they conclusively identify the most appropriate solutions to difficult problems of reconstruction. In a word, typological comparison renders salutary aid to comparative-historical procedures.

All of these newly discovered or at least newly rethought linguistic principles now confront each concrete linguistic work with inevitable and inescapable demands. Gamkrelidze and Ivanov's *Indo-European and the Indo-Europeans* fulfills in every respect the goal promised in its subtitle, 'A reconstruction and historical typological analysis of a protolanguage and a proto-culture'. The deep shifts and transformations that characterize the stage now attained in linguistics, and in which no small creative role has fallen to these two authors, lie at its methodological foundation. The approaches to particular problems of Proto-Indo-European linguistic antiquity taken by researchers from around the world are brought to bear here, and an appealing answer is given to the various theses that entered scientific currency at the turn of the century. This work stands out not only for its unusual answers to old questions, but in the very way it poses questions and the unprecedented breadth of its thematic horizon.

Consistent with the dialectic removal of the dichotomy of synchrony and diachrony and with the parallel inclusion of spatial diffusion among internal linguistic factors, the book naturally transforms the time-honored, spatially and temporally uniform view of Proto-Indo-European and creates a model of dynamic synchrony which fully comprehends the foundations of the protolanguage, its evolutionary shifts, its internal, regional differentiation, and its recurrent intersections with neighboring linguistic areas. It is the questions of mutual interactions among the dialects of Proto-Indo-European and the relations of the protolanguage to neighboring protolanguages that have given rise to the authors' richly promising work on the geographical definition of the (Southwest Asian) Indo-European homeland and the early migratory routes followed by the various branches of Proto-Indo-European.

The widened range of treatments of two concepts — comparison and system — in modern linguistics is linked to a consistently progressive relativization of all of linguistics and the steady transformation of linguistics into a science of language-internal relations, while the attention of linguists, especially Ivanov and Gamkrelidze, is concerned primarily with the unbreakable mutual connection of parts and whole, especially the central notion of the entire complex problematic: the relation of invariant and variation, the essential theme of all contemporary scientific thought. The dependency of variation on a diversity of contexts becomes all the more clear with the development of the main thesis of contemporary linguistics, which opposes context-free languages, i.e. artificial formal systems, to context-sensitive natural language. Here, of course, variation of form and meaning plays an essential role: both on the sound plane and at various levels of grammatical meaning the systematic extraction of invariants

grows into a central linguistic task.

This entire methodological program is realized in the reconstruction of Indo-European. In breaking the phoneme down into its minimal distinctive components the notion of context, formerly limited to the temporal sequential context of phoneme combinations, has expanded to include simultaneous combinations, and this double assessment of phonological combinations continues to reveal new, previously unstudied typological regularities both within and between the two kinds of combinations. The authors have made notable typological contributions on favored and disfavored combinations of differential components on the axis of simultaneity (see Gamkrelidze's chapter in *Problemy lingvističeskoj tipologii i struktury jazyka*: Institute of Linguistics, Soviet Academy of Sciences, 1977) and on the varieties of symmetrical relations that Ivanov has shown to lie at the foundation of linguistic structure. In particular, the picture of Indo-European consonantism gains novel, internally convincing shape in the work of these authors.

As the problematics of context is developed, the simplistic treatment of stylistic variants as free variants yields to an understanding of style as a context of its own, and the conditions imposed on language by various speech functions are incorporated into the general understanding of context. We are indebted to the authors' initiative in including Indo-European poetics, in particular metrics and the questions of anagrammatic tradition raised by Saussure, among the tasks of linguistic reconstruction.

It is no accident that reconstruction of protolanguage and reconstruction of proto-culture are treated together here as connected parts of a single whole; a consistently holistic approach requires that the reconstructed proto-lexicon be analyzed into semantic fields and the corresponding prehistoric realia be reconstructed through the prism of the Proto-Indo-European lexicon. The notion of the lexicon as a structural system, which has usually lagged behind the phonological and grammatical planes in linguistic work, is reliably grounded here, and in such areas as mythology and ritual it shows the way to systematic application of the comparative method.

In the number and magnitude of the questions it asks and answers it proposes this work occupies a unique place. Fully consistent with the highest standards of contemporary theoretical work, the book in turn will certainly provide valuable impetus not only to linguistic analysts of all schools, but also to specialists in related fields, for instance ethnographers, culture historians, and archeologists. A great deal of fruitful discussion will come forth in international science as a result of this momentous work.

Roman Jakobson

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The languages (Indo-European and non-Indo-European) and their written sources

1. Indo-European languages

1.1. Anatolian

The Anatolian languages of ancient Asia Minor — Hittite (written in cuneiform), Luwian (cuneiform and hieroglyphic), and Palaic — are attested in documents from the Boghaz-Köy archive of the second millennium B.C. The oldest Hittite cuneiform texts can be dated by paleographic features (their ancient ductus) to the period of the Old Hittite Kingdom (first half of the second millennium B.C.) and include royal inscriptions: the oldest, that of King Anittas (18th century B.C.: Neu 1974), the Annals of King Hattusilis (17th century B.C.: Imparati 1965), and the Will of King Hattusilis I (Sommer and Falkenstein 1938); there are also historical inscriptions (that of Zukrashi: Otten 1953) and others from KUB and KBo (see Laroche 1971). Also composed in the Old Hittite period is the early variant of the Hittite Laws (Friedrich 1959; Imparati 1964). An archaic form of the language similar to that of Old Hittite is found in many ritual and mythological texts: the Myth of Telepinus (KUB XVII 10; XXXIII), the metrical text about the god Pirwa (Bo 6483: Otten 1951), a burial song (also metrical) (KBo III 46), hymns to the sun (KUB XXI 127-34, XIV 74), a building ritual (KUB XXIX 1), royal burial rituals (Otten 1958), the Prayer of Mursilis II in a Time of Plague (Goetze 1929), and others. Archaic features are also preserved in Middle Hittite texts such as the Text of Madduwattas (Otten 1969): see Heinhold-Krahmer et al. 1979. In the Late Hittite period (14th-13th centuries B.C.), Hittite texts show significant influence from spoken Luwian (for instance, Luwian words marked with the special cuneiform Glossenkeil sign ◀).

Luwian is attested in cuneiform texts, chiefly rituals, of the time of the Hittite Kingdom as well as in later hieroglyphic inscriptions of southern Asia Minor and northern Syria, written in their own hieroglyphic script (Laroche 1960:I; Meriggi 1966-1975).

Palaic is known from fragments, chiefly of mythological and ritual texts, found among the Hittite cuneiform inscriptions (Kammenhuber 1969a).

The later Anatolian languages of Asia Minor are descendants of Hittite and Luwian: these are Lydian and Lycian, attested in alphabetic documents of classical times (Houwink ten Cate 1961, Gusmani 1964, Heubeck 1969, Neumann 1969, Laroche 1974; cf. also Zgusta 1964a).

1.2. Indo-Iranian (Aryan) languages

The earliest evidence of an Indo-Iranian dialect is Mitannian Aryan, attested in the form of Indo-Iranian words and deity names contained in Hittite texts, chiefly texts about the training of horses (Kammenhuber 1961, Mayrhofer 1966).

The oldest actual texts in an Indo-Iranian language are the Old Indic texts of the Rigveda, written down in Indian syllabary in the first millennium B.C. but composed much earlier, probably in the second millennium B.C. The oldest hymns of the Rigveda were probably composed before the entry of Indo-Aryan tribes into northwest India (Aufrecht 1955, Elizarenkova 1972, 1982). The archaic Vedic language that represents the earliest form of Indic is also used in the Atharvaveda (M. Bloomfield 1899, Elizarenkova 1976). The later literary form of the language is often simply called Sanskrit (*saṃskṛta*- 'perfected').¹

Sanskrit literature in the broad sense also includes archaic prose texts of religious and philosophical content, later than the Vedic texts: the Brahmanas and Upanishads (see Van Buitenen 1962, Satya Shraya 1977). The ancient juridical tradition is reflected in numerous texts, of which the best known are the Laws of Mana (*Mānava Dharma Śāstra*): see Nārāyaṇ Rām Āchārya 1946. Sanskrit continued to be used as a literary language parallel to the spoken Middle Indic Prakrits from which today's Indo-Aryan languages evolved: Hindi, Bengali, Panjabi, Sindhi, and others (Bloch 1934).

A separate branch of Indo-Iranian is the Kafir, or Nuristani, languages spoken in the mountainous part of Afghanistan (Nuristan, earlier Kafiristan). These are unwritten languages: Kati, Ashkun, Waigali, Prasun (Strand 1973, Grjunberg 1971, 1980; for individual languages see Morgenstierne 1929, 1949, 1954, Fussman 1972). Related to the Kafir languages are the Dardic languages, which fall into two subgroups, Central Dardic (Dameli, Pashai, Gawar-Bati, Shumashti, and others) and Eastern Dardic or Dardic proper (Phalura, Kashmiri, Shina, Garwi, and others): Èdel'man 1965.

The other branch of Indo-Iranian is Iranian, of which Avestan and Old Persian are attested in ancient documents. The hymns of the Avesta, written in Avestan (which has Eastern Iranian dialect traits), were composed in the second and first millennia B.C. but written down in alphabetic writing much later, in the first millennium A.D. The four major parts of the Avesta that have come down to us are the Yasna — which includes the Gathas, hymns attributed to Zarathustra (Humbach 1959) — the Vispered, the Videvdāt (or Vendidad), and the Yashts (hymns), as well as fragments (Geldner 1886-1895). Old Persian, which represents the Western Iranian dialect type, is known from cuneiform documents of the Achaemenid period (6th to 4th centuries B.C.), historical in

1. [Sanskrit citations in this book are largely from Vedic. Hence they are usually identified as simply Sanskrit, abbreviated Skt. — JN.]

content (Herzfeld 1938, Cameron 1951, Brandenstein and Mayrhofer 1964). Median is the language of the Medes (8th to 6th centuries B.C.), reconstructed from individual words (personal names and tribe names) found in Assyrian and Greek sources and in Old Persian inscriptions (see Mayrhofer 1968).

The Middle Iranian languages are divided into eastern and western groups. Eastern Iranian languages include Khotanese Saka (texts of the first millennium B.C. from Central Asia: Bailey 1945-1956, 1951), Sogdian (Benveniste 1940, Henning 1940, Mackenzie 1976, Livšic and Xromov 1981:347-514), Khwarezmian (Frejman 1951), and Bactrian (Humbach 1966-1967, Steblin-Kamenskij 1981:314-16). Western Iranian languages include Middle Persian, or Pehlevi, attested in numerous texts from Sassanid Iran (Henning 1955), and Parthian (texts from Central Asia: Diakonoff and Livšic 1960, Gignoux 1972, Diakonoff and Livšic 1976).

Modern Iranian languages of the eastern group include Ossetic of the Caucasus, with two dialects, Iron (eastern) and Digor (western), considered to be derived from Scythian, which is known from individual words and personal names in the writers of classical antiquity (Abaev 1949); Yagnobi in Central Asia, a direct descendant of Sogdian; Pashto or Afghan; Munji (and its Yidga dialect); and the Pamir languages: Shugni, Rushan (and dialect Khuf: Sokolova 1959), Bartang, Oroshor, Sarikoli, Yazgulami, Ishkashim (and dialect Sanglechi), and Wakhi (see Paxalina 1959, Grjunberg and Steblin-Kamenskij 1976). Western Iranian languages include modern Persian, Tajik, Kurdish, Baluchi, Tat, Talysh, Ormuri, Parachi, and several dialects of central Iran (see Morgenstierne 1929-1938).

1.3. Armenian

Classical Armenian (Grabar) is known from numerous texts going back to the fifth century A.D., including Bible translations and original texts such as the History of Armenia by Moses of Khorene, both of which include fragments of older texts from the prehistoric period of Armenian (Schmitt 1981:215ff.). There are two main groups of Armenian dialects: eastern (in the Transcaucasus) and western (Meillet 1936).

1.4. Greek

The earliest form of an ancient Greek dialect is Mycenaean, known from Cretan and Mycenaean documents in the Linear B script dating to the 15th-13th centuries B.C. (Morpurgo 1963, Ventris and Chadwick 1973). The oldest texts of the next period are the Iliad and the Odyssey of Homer. The main dialects of

ancient Greek are Attic-Ionic (including the Ionic dialects of Asia Minor and the Cyclades as well as Euboean and Attic), Achaean, including Aeolic and northern Achaean (Thessalian, Boeotian, and Aeolian of Asia Minor and Lesbos), and southern Achaean (Arcadian on the Peloponnese, Pamphylian or Cypriot on Cyprus; this dialect is close to Mycenaean); Doric and Northwest Greek (spoken in Laconia, Messenia, the Argolid, the islands of Aegina and Crete and other Aegean islands, and Corinth and Megara). See Buck 1910, Bechtel 1921-1924, Schmitt 1977; also Risch 1979a.

1.5. Phrygian

Phrygian is known from inscriptions from the first half of the first millennium B.C., from northwestern Asia Minor. A few of these are early inscriptions dating back to the seventh century B.C., written in an archaic script similar to the early Greek alphabet; most are later inscriptions of the Roman period, written in the ordinary Greek script of the time (Gusmani 1958, O. Haas 1966, Diakonoff and Neroznak 1977, Neroznak 1978).

1.6. Tocharian

The Tocharian languages are attested in texts from the second half of the first millennium A.D., at the easternmost periphery of Indo-European speech in Eurasia, in Eastern Turkestan [Xinjiang]. There are two languages, conventionally called Tocharian A (East Tocharian) and Tocharian B (West Tocharian). Most of the texts are translations of Sanskrit Buddhist documents, but there are a few original texts: business letters, monastic administrative texts, accounting documents (Sieg and Siegling 1921, 1949-1953, W. Thomas 1964).

1.7. Albanian

Albanian, in the western Balkan peninsula, as attested from the 16th century A.D. There are two main dialects: Geg (northern, in Albania and Kosovo) and Tosk (southern): see Desnickaja 1968, Solta 1980.

1.8. "Ancient European" languages

The term "Ancient European" will be used to include the dialectally and areally related Indo-European languages of Europe from the end of the second millen-

nium B.C. to the beginning of the first millennium B.C. (Krahe 1951, 1954, 1959, 1962).

1.8.1. Italic languages. This is a family of languages of the Apennine Peninsula of ancient times, including the Latin-Faliscan and Osco-Umbrian subgroups, and attested in documents from the first millennium B.C. (Vetter 1953, Solta 1974):

Latin (originally the language of Latium and Rome) and the closely related Faliscan (the dialect of Falerii in southern Etruria) are attested in inscriptions going back to the sixth century B.C., written in a Greek-derived alphabetic script. The oldest Latin is attested in several inscriptions (Ernout 1950:274ff.),² Saturnian verse, and the works of early Roman authors (Plautus, Terence).

The Osco-Umbrian subgroup includes the dialects of the Oscans (inscriptions in Samnia and Campania), the Volsci, the Umbrians, and other Sabellian tribes. The most important Umbrian document is the bronze Iguvine tablets (from Iguvium): Poultney 1959, Vetter 1955, Ernout 1961. At the beginning of the present era the Osco-Umbrian languages yielded to Latin.

Venetic. A distinct Indo-European dialect known from brief inscriptions of the fifth to first centuries B.C. in northeastern Italy (Beeler 1949, Krahe 1950, Untermann 1961).

Illyrian. Known from brief Messapic inscriptions from Calabria and Apulia (southern Italy). Illyrian is also known from onomastics of the Italic peninsula, the northwest Balkan peninsula, and adjacent regions (Krahe 1955, Mayer 1957-1959; cf. Tronskij 1953:57-59).

1.8.2. Celtic languages. The Celtic languages fall into two groups: continental Celtic and insular Celtic. On the evidence of Celtiberian inscriptions, speakers of continental Celtic dialects lived in Iberia from the first half of the first millennium B.C. (Lejeune 1955a, Tovar 1961, Untermann 1961a), and in Gaul (modern France) in Roman times, from which there are a number of short inscriptions in Gaulish. Other groups of Celts lived in central Europe: southern and western Germany, the Alpine regions, Pannonia, Italy, and the Balkan peninsula. Insular Celtic, found on the British Isles, includes the Goidelic and Brythonic dialect groups. Goidelic includes Old Irish, attested in Ireland in the Ogam script from the fourth century A.D. and in later texts in the Latin alphabet, as well as Scots Gaelic and Manx. The Brythonic group includes Welsh (Old Welsh is attested in glosses and written documents from the 11th century A.D.), Cornish, and Breton, brought to Brittany by immigrants from Britain in the 5th century A.D. (Old Breton glosses go back to the eighth to eleventh centuries: Jackson 1953).

2. The Praenestine fibula (allegedly from 600 B.C.), formerly considered to be the oldest Latin inscription, has recently been shown to be a forgery created in the 19th century (see Guarducci 1980, Pfister 1983).

1.8.3. Germanic languages. The Germanic languages are usually divided into three groups: Scandinavian (or North Germanic), East Germanic (Gothic), and West Germanic. North and East Germanic are put in a single Gothic-Scandinavian group by some investigators. The earliest attested Scandinavian language — the language of the ancient Scandinavian runic inscriptions — is still close to Proto-Germanic (Makaev 1965). The oldest texts in Old Icelandic (Old Norse) are collected in the Elder Edda (Neckel 1962), a parchment manuscript miscellany of old songs compiled in Iceland in the 13th century but composed much earlier. Old Icelandic also has an extensive prose literature and skaldic poetry. In about the middle of the second millennium A.D. Old Icelandic (Old Scandinavian) split into West Scandinavian (Norwegian and Icelandic) and East Scandinavian (Swedish and Danish) (M. Steblin-Kamenskij 1953).

The primary representative of East Germanic is Gothic, whose oldest document is a Bible translation done by the bishop Wulfila in the 4th century A.D. Gothic was spoken in eastern and southeastern Europe in lands belonging to the Byzantine sphere of influence. There is evidence for the presence of Goths in Byzantium itself, as well as on the Crimea (in the form of a Crimean Gothic word list: Žirmunskij 1964:85-102).

West Germanic (or South Germanic if opposed to a Gothic-Scandinavian branch) includes Old English (or Anglo-Saxon, with texts from the 7th century A.D.), Old Frisian, Old High German (texts from the 8th century A.D.), and Old Saxon (texts from the 9th century), the earliest representative of the Low German dialects. English and Frisian make up an Anglo-Frisian subgroup, opposed to High German dialects, while Low German is intermediate between these two. The earliest poetic texts in West Germanic languages include the Old English epic of Beowulf (Irving 1968, 1969, Wrenn 1973), the Old High German Song of the Nibelung (Körner 1921), and the Old Saxon epic Heliand (Behaghel 1933). The descendants of these languages are modern English, German, Flemish, and Dutch (the latter from Low German dialects).

1.8.4. Baltic languages. There are two groups: West Baltic, represented by Old Prussian (with written texts from Prussia in the 14th-18th centuries A.D.: Mažiulis 1966-1981), which subsequently yielded to German, and East Baltic, including Lithuanian and Latvian (texts go back to the 16th century; see Zinkevičius 1980:1.15-18).

1.8.5. Slavic languages. There are three groups: East Slavic (Russian, Ukrainian, Belorussian, with early documents going back to the 11th century); West Slavic (Polish, Slovencian-Kashubian, Czech, Slovak, Sorbian, and extinct Polabian); and South Slavic (Bulgarian, Serbo-Croatian, Slovene, and others), with early texts in Old Church Slavic (translations of Greek texts beginning in

the 11th century A.D.: the Zographensis and Marianus Gospel translations in the Glagolitic alphabet, and in the Cyrillic alphabet the Savvina Kniga of Gospel readings, the Sinai Psalter, the Suprasliensis collection of lives of saints and prophets, and others).

2. Non-Indo-European languages in adjacent parts of Eurasia

2.1. Ancient Near Eastern languages

Hattic. The non-Indo-European language of the indigenous population of northeastern Asia Minor, attested in the form of fragments in Hittite texts. Extinct since the early second millennium B.C. (Kammenhuber 1969).

Sumerian. A non-Indo-European language of Mesopotamia, attested in early pictographic and cuneiform texts going back to the 4th and 3rd millennia B.C. Subsequently yielded to Akkadian. There is evidence for different periods in the history of Sumerian, which point to changes in phonetics and grammatical structure.

Elamite. A non-Indo-European language of southwestern Iran (the mountain valley of the eastern Tigris, modern Khuzistan), with hieroglyphic and cuneiform texts going back to the beginning of the second millennium B.C. Yielded to Old Persian by the first millennium (Diakonoff 1967, Reiner 1969).

Hurrian-Urartean. A non-Indo-European language family, attested from the third to first millennia B.C. in various parts of Southwest Asia: upper Mesopotamia, northern Syria, Asia Minor, the southern Transcaucasus, and northwest Iran. The earliest appearance of the Hurrians in the Near East (specifically, northern Syria) was in the mid-third millennium B.C., at which time in the vicinity of Ebla (modern Tell Mardik) there flourished a powerful Semitic-speaking state with Hurrians as one of its ethnic components. The earliest Hurrian texts date from the second half of the third millennium. The Nawara inscription, from the valley of the Diyala, an eastern tributary of the Tigris, was written in Old Akkadian for the Hurrian king Arižen (or Ari-šen or Atal-šen): see Diakonoff 1967:114, Wilhelm 1982). The oldest Hurrian document in Hurrian proper is an inscription from Urkish in northern Mesopotamia, also written in Old Akkadian cuneiform of the same kind (see Diakonoff 1967:6-7, Haas et al. 1975:24). In the second millennium B.C. there are many Hurrian texts from Mari, Boghaz-Köy, and Ugarit (the latter using two different writing systems: a syllabic logographic type and a consonantal-syllabic one of the ancient Semitic type). Hurrian was the main language of the Mitannian kingdom of Mesopotamia in the mid-second millennium B.C. The El Amarna archive yielded an extensive Hurrian text in the form of a letter from the ruler Tushratta to the Egyptian Pharaoh Amenhotep III from the early 14th century

B.C. (Speiser 1941, Laroche 1978).

A later Hurrian dialect is Urartean of the Kingdom of Van in the southern Transcaucasus, written in Assyrian cuneiform. The texts date to the first half of the first millennium B.C. (Melikišvili 1960, Diakonoff 1971).

2.2. *Semitic languages*

A family of Near Eastern languages attested in written texts from the 2nd millennium B.C.:

East Semitic comprises Akkadian, with Babylonian and Assyrian dialects, spoken in Mesopotamia and adjacent regions. The following stages are distinguished for Akkadian: Old Akkadian (24th-22nd centuries B.C.); Old Babylonian (in southern Mesopotamia) and Old Assyrian (in the middle Tigris and the Cappadocian tablets from Asia Minor), from the beginning of the 2nd millennium B.C.; Middle Babylonian and Middle Assyrian (16th-11th centuries B.C.); Neo-Babylonian and Neo-Assyrian (10th-8th centuries B.C.). The Akkadian inscriptions used a cuneiform script of Sumerian origin, with some changes adapting it to Akkadian dialects.

West Semitic languages from the eastern Mediterranean area (Palestine and Syria). These include the Canaanite subgroup: Paleo-Canaanite or Eblaite (spoken in northern Syria and attested in recently discovered inscriptions from Ebla dated to the mid-third millennium: Pettinato 1975, Gelb 1977); Moabite, represented in one lengthy inscription of the king Mesha (11th century B.C.); Phoenician, with inscriptions beginning in the second half of the second millennium B.C.; (ancient or Biblical) Hebrew, with documents from the end of the second millennium B.C.; and Aramaic, attested in many inscriptions beginning in the first millennium B.C. Several different Aramaic dialects are distinguished: West Aramaic (Nabatean, Palmyrene, Judeo-Palestinian, Samaritan, and others) and East Aramaic (Syriac, Mandaic, and others). The oldest inscriptions in the West Semitic languages are in a linear script of the consonantal-syllabic type going back to an early Semitic prototype.

The Ugaritic language of ancient Ugarit (modern Ras-Shamra, Syria) forms a separate branch within West Semitic. Its texts, dating to the mid-second millennium B.C., are written in a distinct consonantal-syllabic cuneiform.

South Semitic languages include (epigraphic) South Arabian dialects (with texts from the first millennium B.C.); their modern forms Mehri, Shahari, and Soqotri; classical Arabic; Geez (or Classical Ethiopic) and the modern Ethiopic languages Amharic, Tigre, Tigrinya, Harari, and others.

2.3. *Ancient Egyptian*

The language of ancient Egypt, attested in hieroglyphic documents from the end of the fourth millennium B.C. on: Old Egyptian, Middle Egyptian, and Late Egyptian (the latter from the mid-second millennium B.C.). The continuation of Egyptian is Coptic, the language of the Egyptian Christians, written in a script derived from Greek uncial writing; it is an extinct language, preserved only in liturgical contexts. Egyptian, together with Semitic and several language families of Africa — Berber, Cushitic, and Chadic — makes up the Afroasiatic family (see M. Cohen 1947, Diakonoff 1965, 1975).

2.4. *Caucasian (or Paleo-Caucasian) languages*

Kartvelian languages. This is a language family of the southern Caucasus, consisting of four related languages: Georgian (with texts going back to the fifth century A.D.), Mingrelian, Laz (or Chan), and Svan.

Abkhaz-Adyghe (Northwest Caucasian). Languages of the northwestern Caucasus, including Abkhaz (with Abaza), Adyghe, Kabardian, and Ubykh.

Nakh-Daghestanian (Northeast Caucasian). Languages of the eastern Caucasus. There are two branches. The Daghestanian branch consists of the Avar-Andi-Tsez group (Avar, Andi, Botlikh, Godoberi, Karati, Akhvakh, Bagvali, Tindi, Chamali, Tsez, Khvarshi, Ginukh, Bezhta, Hunzib); the Lezghian group (Lezghi, Tabassaran, Agul, Rutul, Tsakhur, Archi, Kryz, Budukh, Xinalug, Udi); Lak; and Dargi. The Nakh branch consists of Chechen, Ingush, and Batsbi (or Tsova-Tush).

2.5. *Dravidian languages*

This is a family of 23 languages spoken for the most part in the southern Indian subcontinent. There are seven major languages: Telugu, Tamil, Kannada, Malayalam, Gondi, Kurukh, and Tulu. Tamil, Telugu, Kannada, and Malayalam have written traditions going back to the beginning of this era. Before the arrival of the Indo-Aryans in India the Dravidian languages were spoken over most of the Indian subcontinent, including the northwestern part; they were displaced by Indic, with which they were in contact for a long period (see Burrow and Emeneau 1961).

2.6. *Munda languages*

A group of languages spoken in India (chiefly its central part) and forming a branch of Austroasiatic, a large family of mostly Southeast Asian languages.

2.7. *Uralic languages*

A family with two branches, Finno-Ugric and Samoyedic. The Finno-Ugric languages are divided into Ugric (Hungarian in central Europe, and Ostyak and Vogul [also sometimes known as Khanty and Mansi] in western Siberia) and Finnic, the latter with subgroups: Finno-Permian (Komi [or Permiak and Zyrian] and Votyak [Udmurt]); Balto-Finnic (Finnish, Veps, Vote, Estonian, Livonian, and others in northeastern Europe); Volgaic (Moksha Mordvin, Erzja Mordvin, Hill Cheremis [Mari], and Meadow Cheremis [Mari]); and Lapp [Saami]. See Hajdú 1975.

2.8. *Altaic languages*

Many scholars group the Turkic, Mongolian, and Tungusic languages together as Altaic.

The Turkic languages are attested in written texts from western Siberia (the Yenisei-Orkhon inscriptions) and Central Asia dating to the seventh century A.D. and written in a Turkic runic script derived from Sogdian (Kononov 1980) and reflecting the Old Turkic (or Old Uigur) language. Turkic languages fall into several subgroups: Chuvash; Southwest or Oghuz Turkic; Northwest or Kipchak; Kirghiz-Altay; and Southeastern (Uigur).

The Mongolian languages include Mongol proper as well as Buriat, Kalmyk, and others such as Oirat, Dagur, and Monguor.

The Tungusic languages include Manchurian and Jurchen (the Manchurian or southern branch) and Evenki, Even, Negidal, Solon, and the languages of the Amur subgroup (the Tungus or northern branch).

2.9. *Paleoasiatic (Paleosiberian) languages*

This is a grouping of genetically unrelated languages of indigenous ethnic minorities of Siberia. Four language families are included in Paleoasiatic: Chukchi-Kamchatkan, Eskimo-Aleut, Yukagir, and Ket-Assan (Yeniseian). The latter group includes several languages of western Siberia extinct since the 17th

to 19th centuries (Kott, Arin, Assan, and others) as well as Ket, spoken on the middle and upper Yenisei.

Also included in Paleoasiatic is the language isolate Nivkh (Gilyak).

2.10. Chinese

Chinese is attested in texts written in pictographic script from the second millennium B.C. The oldest texts come from northern and central China. The phonetic forms of Old Chinese words have been reconstructed by comparative analysis of the modern dialects and analysis of words borrowed into other Asian languages — Japanese, Korean, Vietnamese, and others (Karlgren 1940). Old Chinese forms are cited in the transcription of Karlgren 1923, 1940. Modern Chinese forms are in *pinyin*.

The territory of Chinese speech forms the easternmost limit of the non-Indo-European languages which have come into contact with Indo-European dialects in the course of the Indo-European migrations.

Transliteration of languages with non-Latin writing systems

In this work, examples from languages with their own traditional scripts are usually cited not in phonetic transcription (unless explicitly indicated) but in Latin transliteration with some additional diacritics and special symbols. The transliteration systems used are generally standard ones for the languages concerned. When necessary, the phonetic content of transliteration symbols for ancient languages is described below in terms of the phonetic and phonological status of the phonemes they represent. Aspiration of voiceless stops, where not indicated in standard transliteration, is described in this section.

Hittite and other Anatolian languages

The transliteration system for Hittite and the other Anatolian languages (Luwian, Palaic) is a one-to-one system rendering each syllabic sign of the cuneiform (or, for Luwian, hieroglyphic) script with the standard combination of Latin letters used in Assyriology (for Hittite see Friedrich 1960), each sign set off by hyphens. In addition, standard unhyphenated transliteration is also used: thus *akkanteš* or *kuenzi* in addition to *ak-ka-an-te-eš* or *ku-en-zi*. This unhyphenated transliteration makes no claim to phonetic or phonological accuracy but is used for economy and convenience.³ Thus, for example, the cuneiform symbols for *š* and *z* in Hittite render [s] and [ts], but will be transliterated here as *š* and *z*. Actual phonetic properties of Hittite sounds will occasionally be explicitly indicated by phonetic or phonemic transcription in square or slant brackets.

Mycenean and classical Greek

Transcriptions of Mycenaean Greek inscriptions, either syllabic or unhyphenated, follow standard practice for rendering Linear B (see Morpurgo 1963, Ventris and Chadwick 1973). Classical Greek is transliterated in standard fashion, except that citations of long verse passages have been left in the original alphabet.

3. It has recently been established that plene writing (or doubling of vowels) represents word stress in Hittite, so that forms such as *e-eš-zi*, *a-ša-a-an-zi*, *pa-ta-a-na*, etc. are to be interpreted phonetically as having not length but stress, i.e. *étsi*, *asáni*, *patán* (see Hart 1980, Caruba 1981). In unhyphenated writing the accent is not indicated (unless otherwise noted), nor is the vowel doubling indicated with a macron (as in *ěszi*, *asānzi*, *patāna*).

Sanskrit

Vedic and other Sanskrit forms are cited in the standard transliteration (see Renou 1930, Mayrhofer 1953). The Old Indic writing system (*devanagari*) was a syllabic one organized by phonetic and morphological paradigmatics of the sounds:

Short syllabics: *a, i, u, ṛ, (ḷ)*
 Long syllabics: *ā, ī, ū, ṝ, (ḹ)*
 Vowels: *e, o* (functionally, these are diphthongs with short first elements: **ai, *au*)
 Diphthongs with long first element: *ai, au* (functionally, **āi, *āu*)
 Non-syllabic sonorants: *y, v, r, (l)*
 Stops:

	Voiceless	Voiceless aspirate	Voiced	Voiced aspirate	Nasal
Palatal	<i>c</i>	<i>ch</i>	<i>j</i>	<i>jh</i>	<i>ñ</i>
Velar	<i>k</i>	<i>kh</i>	<i>g</i>	<i>gh</i>	<i>ṇ</i>
Cerebral (retroflex)	<i>ṭ</i>	<i>ṭh</i>	<i>ḍ</i>	<i>ḍh</i>	<i>ṇ</i>
Dental	<i>t</i>	<i>th</i>	<i>d</i>	<i>dh</i>	<i>n</i>
Labial	<i>p</i>	<i>ph</i>	<i>b</i>	<i>bh</i>	<i>m</i>

Sibilants: *s, ṣ* (cerebral), *ś* (palatal)

Aspiration: voiced spirant *h* and voiceless *ḥ* (*visarga*), an allophone of *s* in word-final position. The nasal vowel *anusvāra* is indicated with *m̐*.

Palatal affricates: *c, ch, j, jh* are compact (hushing) sounds, phonetically *č* (= [tʃ]), *ḥ* (= [dʒ]), etc.

Tocharian

Tocharian texts are written in Indic script and transliterated as for Sanskrit, with the addition of *ā*, a distinct front vowel, and *ts* for [ts].

Avestan, Old Persian, and other Iranian languages

Avestan is written in a script derived from Aramaic-Pehlevi with some additions and changes, and is cited in a normalized standard transliteration (see Reichelt 1909, Morgenstierne 1942):

Vowels:	<i>a, ā, i, ī, u, ū, e, ē, o, ō, ǎ, ǣ</i>
Reduced vowels:	<i>a, ā</i>
Nasal vowel:	<i>ǣ</i>
Stops:	
Labial:	<i>p, b</i>
Dental:	<i>t</i> (<i>t</i> word-finally in certain positions), <i>d</i>
Velar:	<i>k, g</i>
Spirants:	
Labial <i>f, w</i> ; dental <i>θ, δ</i> ; velar <i>x, xʷ, ɣ</i>	
Sibilants:	
Hissing <i>s, z</i> ; compact (hushing) <i>š⁴, ž, ʒ</i>	
Aspiration:	<i>h</i> (corresponding to several different signs) ⁵
Affricates:	compact (hushing) <i>č, ȝ</i>
Sonorants:	
Nasal:	<i>m, n, ŋ, (ŋ)</i>
Oral:	<i>y, v, r</i>

A simpler transliteration system is standard for Old Persian, which was written in syllabic cuneiform (see Kent 1953, Brandenstein and Mayrhofer 1964):

Vowels:	<i>a, ā, i, ī, u, ū</i>
Stops:	<i>b, d, g</i>
	<i>p, t, k</i>
Affricates:	<i>j, č</i>
Spirants:	<i>v, f</i>
	<i>þ</i>
	<i>z, s</i>
	<i>š, ʒ</i>
	<i>h</i>
Aspiration:	<i>h</i>
Sonorants:	<i>m, n, y, r</i>

Forms from Middle Iranian dialects such as Sogdian, written in a consonantal script derived from Aramaic, are transliterated without vocalism.

4. This symbol renders several signs of the Avestan script. According to Morgenstierne, they correspond to three distinct phonemes: /š/, /š'/, /ʃ/.

5. In addition to *h* there is also a sign for a palatalized variant *h'*.

Classical Armenian

The transliteration system used here is that of Meillet 1936, 1937, 1938:45, with some later corrections in the aspirated affricates (Schmitt 1972, 1981):

Stops:

Voiceless: *p, t, k*

Voiceless aspirated: *p', t', k'*

Voiced: *b, d, g*

Affricates:

Voiceless: *c, č*

Voiceless aspirated: *c', č'*

Voiced: *j* (= [dz]), *ȝ* (= [dʒ])

The phonological opposition of voiceless unaspirated to voiceless aspirated affricates is best understood not as an opposition like that of Indic *č* to *čh* but as an opposition of glottalized (unaspirated) to unglottalized (aspirated), like that of *c'* to *c* or *č'* to *č* in Caucasian languages.

There are distinct letters for two types of non-nasal sonorants: *l* and *ł* (the latter velarized), and *r* and *ř* (the latter a trill which can be interpreted as long or geminate: see Bolognesi 1962, Schmitt 1972:303). *ē* transliterates a closed vowel reflecting a former diphthong and found only in stressed syllables; *ə* is a short tense vowel found in unstressed syllables.

Gothic and other Germanic languages

The Gothic writing system, based on late Greek uncial script, is transliterated with Latin letters and some additional characters: *þ*, a voiceless dental or interdental spirant (like English [θ]), *q* for the labiovelar stop [k^o], and *h* for the labialized fricative [h^o]. [w] and [j] are transliterated *w* and *j*. The same symbols are used for transliterating runic letters, with *R* indicating a voiced spirant similar to a vibrant.

In Icelandic orthography, the acute accent marks vowel length: e.g. *ý* indicates [ū]. The fricatives [β] and [ð] (and in Old English also [θ]) are written with the barred letters *þ* and *ð* (or *ḍ*).

In Old High German, *z* indicates the affricate [ts].

Slavic languages

Old Church Slavic forms, whether originally written in Glagolitic or Cyrillic, as well as words from modern Slavic languages written in Cyrillic (Russian, Belorussian, Ukrainian, Bulgarian), are written in standard academic transliteration: *y* is a high central or back unrounded vowel, *ɛ* an open or low front vowel, *ɪ* and *ʊ* short (or reduced) high vowels (where these letters, known as *jers*, are retained in later orthographies including Old Russian, they are transliterated with single and double apostrophes: ' and ''); *ɤ* and *ɶ* are nasalized vowels; *c* is [ts], *č* is [tʃ], and *x* is the voiceless velar fricative. The modern jotted vowels are transliterated with letter sequences: *ja*, *ju*.

Italic languages

The Italic languages Faliscan, Oscan, and Umbrian, together with other ancient languages of Italy including Messapic and Venetic, are transliterated with ordinary Latin script (in which *c* indicates [k] and *u* indicates [w]). Oscan *í* and *ú*, with acute accent, indicate [e] and [o].

Old Irish

Irish words written in Latin letters are spelled as in the original. The combination *th* indicates a voiceless dental spirant [θ], and *ch* is voiceless velar [x]. Vowel length is shown by an acute accent: *é*, *ó*, etc.

Kartvelian languages

Words from Kartvelian languages are transliterated as follows, with the apostrophe marking glottalization. Voiceless stops are aspirated, but this is not indicated in transliteration.

Stops and affricates:

	Voiced	Voiceless (aspirated)	Glottalized
Labial	<i>b</i>	<i>p</i>	<i>p'</i>
Dental	<i>d</i>	<i>t</i>	<i>t'</i>
Velar	<i>g</i>	<i>k</i>	<i>k'</i>
Postvelar	—	<i>q</i>	<i>q'</i>
Alveolar	<i>ʒ</i>	<i>c</i>	<i>c'</i>
Palatal	<i>ʃ</i>	<i>č</i>	<i>č'</i>

Fricatives:

Alveolar	<i>z</i>	<i>s</i>
Palatal	<i>ʒ</i>	<i>ʃ</i>
Velar	<i>ɣ</i>	<i>x</i>

Semitic languages

Words from Semitic languages are transliterated using the standard system of Latin letters with some additional marks and letters.

Laryngeals and pharyngeals:	'	^c
	<i>h</i>	<i>ḥ</i>

Stops (followed by their fricative variants):

	Voiced	Voiceless	Emphatic
Labial	<i>b / ḃ</i>	<i>p / ṗ</i>	— (<i>ḥ</i>)
Dental	<i>d / ḏ</i>	<i>t / ṭ</i>	<i>ḏ</i> <i>ṭ</i>
Velar	<i>g / ḡ</i>	<i>k / ḱ</i>	<i>ḱ</i>

Fricatives:

Alveolar	<i>z</i>	<i>s</i> <i>ś</i> <i>š</i>	<i>ẓ</i>	<i>ṣ</i>
Interdental	<i>ḏ</i>	<i>ṭ</i>	<i>ḏ</i>	<i>ṭ</i>
Velar	<i>ɣ (ḡ)</i>	<i>x (ḫ)</i>		
Labial	<i>(v)</i>	<i>f</i>		

Sonorants: *r, l, m, n*

Semivowels: *w, y*

Affricates: *ǧ* *č*

Vowels:

Short	<i>a</i>	<i>e</i>	<i>i</i>	<i>o</i>	<i>u</i>
Long	<i>â (ā)</i>	<i>ê</i>	<i>î (ī)</i>	<i>ô</i>	<i>û (ū)</i>
Extra-short	<i>a</i>	<i>e</i>		<i>o</i>	

Abbreviations

Languages and dialects

Abkh.	Abkhaz	ELith.	Eastern Lithuanian
Aeol.	Aeolic (Greek)	Engl.	English
Akk., Akkad.	Akkadian	Est.	Estonian
Alb.	Albanian	Etr.	Etruscan
Arab.	Arabic	Falisc.	Faliscan
Aram.	Aramaic	Fi-U	Finno-Ugric
Arc.-Cypr.	Arcado-Cyprian	Finn.	Finnish
Arm.	Armenian	Finno-Perm.	Finno-Permian
Assyr.	Assyrian	Finno-Volg.	Finno-Volgaic
Att.	Attic	Finno-Volg.-Perm.	Finno-Volgaic- Permian
Av., Avest.	Avestan	Fr.	French
Bashk.	Bashkir	Gaul.	Gaulish
Boeot.	Boeotian	Geo., Georg.	Georgian
Bret.	Breton	Ger.	German
Buddh. Sogd.	Buddhist Sogdian	Gk.	Greek
Bulg.	Bulgarian	Gmc.	Germanic
Burm.	Burmese	Goth.	Gothic
Celt.	Celtic	Hatt.	Hattic
Ch.	Chechen	Hebr.	Hebrew (Biblical)
Chin.	Chinese	Hier. Luw.	Hieroglyphic Luwian
ChSl.	Church Slavic	Hitt.	Hittite
Chuv.	Chuvash	Hom.	Homeric (Greek)
Cl., Class.	Classical	Hung.	Hungarian
ClMong.	Classical Mongolian	Hurr.	Hurrian
Copt.	Coptic	I.	Ingush
Corn.	Cornish	Icel.	Icelandic
Cret.	Cretan	IE	Indo-European
Crim. Goth.	Crimean Gothic	Illyr.	Illyrian
Cypr.	Cypriot	Indo-Iran.	Indo-Iranian
Cz.	Czech	Ion.	Ionian (Greek)
Dan.	Danish	Ir.	Irish
dial.	dialectal, dialect	Iran.	Iranian
Dor.	Doric	Ital.	Italic
Eg., Egypt.	Egyptian		
Elam.	Elamite		

Jap.	Japanese	O	Old (followed by language name)
Kabard.	Kabardian		
Kartv.	Kartvelian	OBret.	Old Breton
Kashub.	Kashubian	OBurm.	Old Burmese
Kirgh.	Kirghiz	OChin.	Old Chinese
Komi-Zyr.	Komi-Zyrian (Zyrian)	OCorn.	Old Cornish
Kurd.	Kurdish	OCS	Old Church Slavonic
L	Low(er) (followed by language name)	OCz.	Old Czech
Lat.	Latin	OE	Old English
Latv.	Latvian	OFal.	Old Faliscan
LGer.	Low German	OFr.	Old French
Ligur.	Ligurian	OFris.	Old Frisian
Lith.	Lithuanian	OGeorg.	Old Georgian
Liv.	Livonian	OHG	Old High German
LSorb.	Lower Sorbian	OHitt.	Old Hittite
Luw.	Luwian	OIcel.	Old Icelandic
Lyc.	Lycian	OIr.	Old Irish
Lyd.	Lydian	OIran.	Old Iranian
M	Middle (followed by language name)	OLat.	Old Latin
Maced.	Macedonian (of classical times)	OLG	Old Low German
Manich. Sogd.	Manichean Sogdian	OLith.	Old Lithuanian
MBret.	Middle Breton	OMaced.	Old Macedonian
MCorn.	Middle Cornish	ONorse	Old Norse
MDutch	Middle Dutch	ONorw.	Old Norwegian
ME	Middle English	OPers.	Old Persian
Messap.	Messapic	OPhyrg.	Old Phrygian
MGk.	Middle Greek	OPol.	Old Polish
MHG	Middle High German	OPruss.	Old Prussian
Ming.	Mingrelian	ORuss.	Old Russian
MIr.	Middle Irish	OSax.	Old Saxon
MLG	Middle Low German	Osc.	Oscan
mod.	modern	Oss.	Ossetic
Mong.	Mongolian	OSwed.	Old Swedish
Mordv.	Mordvin	OTib.	Old Tibetan
MParth.	Middle Parthian	OTurk.	Old Turkic
MPers.	Middle Persian	OUkr.	Old Ukrainian
MWelsh	Middle Welsh	OWelsh	Old Welsh
Myc.	Mycenean Greek	Pal.	Palaic
Norw.	Norwegian	Pamph.	Pamphylia
		Parth.	Parthian
		Pehl.	Pehlevi
		Perm.	Permian

Pers.	Persian	Toch.	Tocharian
Phoen.	Phoenician	Toch. A	Tocharian A
Phryg.	Phrygian	Toch. B	Tocharian B
PIE	Proto-Indo-European	Turco-Bulg.	Bulgar Turkic
Pol.	Polish	Turk.	Turkish
Polab.	Polabian	Tyrol.	Tyrolean
Prak.	Prakrit	Ugar., Ugarit.	Ugaritic
RChSl.	Russian Church Slavic	Ukr.	Ukrainian
Rum.	Rumanian	Umbr.	Umbrian
Russ.	Russian	Ur., Uart.	Urartean
S.Arab.	South Arabian	USorb.	Upper Sorbian
Sem.	Semitic	Uzb.	Uzbek
Serbo-Cr.	Serbo-Croatian	Ved.	Vedic
Skt.	Sanskrit	Venet.	Venetic
Slav.	Slavic	VLat.	Vulgar Latin
Sogd.	Sogdian	Volg.-Perm.	Volgaic-Permian
Sum.	Sumerian	Volsc.	Volscian
Swed.	Swedish	WGk.	West Greek
Syrac.	Syracusan	WOsset.	West Ossetic
Thess.	Thessalian	WSem.	West Semitic
Thrac.	Thracian	Yazg.	Yazgلامي
Tkc.	Turkic		

Grammatical terms

A	active	imper.	imperative
abl.	ablative	imperf.	imperfect
acc.	accusative case	In	inactive
Ad	addressee	inf.	infinitive
adj.	adjective	instr.	instrumental case
aor.	aorist	intrans.	intransitive
C	consonant	loc.	locative case
caus.	causative	masc.	masculine
cond.	conditional	neut.	neuter
D	voiced stop	nom.	nominative case
D	designee	NP	noun phrase
dat.	dative	O	object
du.	dual	opt.	optative
fem.	feminine	p	preverb/adposition
gen.	genitive case	p.	person (e.g. 2p. =
H	laryngeal		second person)

pass.	passive	T	voiceless stop
perf.	perfect	trans.	transitive
pers.	personal	V	vowel
pl.	plural	V	predicate, verb
ppl.	participle	VM	version marker
pres.	present	voc.	vocative case
pret.	preterite	VP	verb phrase
R	sonorant, resonant	1	first person (e.g. 1sg. = first-person singular)
S	subject	2	second person (e.g. 2pl. = second-person plural)
s.th.	'something' (in English glosses)	3	third person (e.g. 3du. = third- person dual)
sg.	singular		
S _{Intr}	subject of intransitive verb		
S _{Tr}	subject of transitive verb		

Sources

Hittite Laws	Hittite Laws (Friedrich 1959)
ABoT	<i>Ankara Arkeoloji Müzesinde bulunan Boğazköy Tabletleri.</i> Istanbul, 1948
Aeschyl. <i>Prom.</i>	Aeschylus, <i>Prometheus</i>
Al.	<i>Der Vertrag des Muwatalliš mit Alakšanduš von Wiluša.</i> J. Friedrich, <i>Mitteilungen der Vorderasiatisch-Aegyptischen Gesellschaft</i> 34:1. Leipzig, 1930
AM	<i>Die Annalen des Muršiliš</i> (Goetze 1933)
Assur	Hieroglyphic Luwian inscription from Assur (Laroche 1960:XXX)
AV	<i>Atharvavedasamhitā</i> (Bloomfield 1899)
Bo	Unveröffentlichte Texte aus Boğazköy. 1. Bo (followed by text number) = Funde von 1906-1912, Istanbul. 2. Bo (followed by year number and text number) = neue Funde, beginnend mit Bo 68/1, Ankara
BoSt	<i>Boghazköi-Studien</i> , Leipzig 1916-1924
BoTU	<i>Die Boghazköi-Texte in Umschrift.</i> E. Forrer, Wissenschaftliche Veröffentlichungen der Deutschen Orientgesellschaft, Leipzig, 1922, 1926
C.A.	Cippus Abellanus (Buck 1905:126ff.)
Carchemish	Hieroglyphic Luwian inscription from Carchemish (Laroche 1960:XXV-XXVI)
Cic. <i>Sen.</i>	Cicero, <i>Post reditum in Senatu.</i> Cicero: <i>The Speeches.</i> The Loeb Classical Library, 48-99
Festus	S. P. Festus, <i>De verborum significatu quae supersunt</i>
H.	Haðōxt Nask (Avesta)
HAB	<i>Die hethitisch-akkadische Bilingue des Hattušili I</i> (Labarna II). (Sommer and Falkenstein 1938)
Hatt.	<i>Hattušiliš. Der Bericht über seine Thronbesteigung nebst Paralleltexten.</i> A. Goetze, <i>Mitteilungen der Vorderasiatisch-Aegyptischen Gesellschaft</i> 29:3. Leipzig, 1925
Herodotus, <i>Hist.</i>	Herodotus, <i>Historiae</i>
Hesychius	Hesychius Alexandrinus, <i>Lexicon</i>
Hipponax	<i>Les fragments du poète Hipponax. Études et Commentaires,</i> 43. Ed. O. Masson, Paris 1962
HT	<i>Hittite Texts in the Cuneiform Character from Tablets in the British Museum.</i> London, 1920

IBoT	<i>Istanbul Arkeoloji Müzelerinde bulunan Boğazköy Tabletleri(nden Seçme Metinler) I-III.</i> Istanbul, 1944, 1947, 1954
Karatepe	<i>Phoenician-hieroglyphic bilingual from Karatepe</i> (Laroche 1960:XXV)
KBo	<i>Keilschrifttexte aus Boghazköi I-VI.</i> Wissenschaftliche Veröffentlichungen der Deutschen Orientgesellschaft, 30, 36. Leipzig 1916-1923; Berlin, 1954-
KUB	<i>Keilschrifturkunden aus Boghazköi.</i> Berlin, 1921-
Madd.	<i>Madduwattaš.</i> A. Goetze, <i>Mitteilungen der Vorderasiatisch-Aegyptischen Gesellschaft</i> 32:1. Leipzig, 1928
MS	<i>Muršiliš Sprachlähmung</i> (Goetze and Pedersen 1934)
Pausanias	Pausanias, <i>Graeciae descriptio</i>
Pestgebete	<i>Die Pestgebete des Muršiliš.</i> A. Goetze, <i>Kleinasiatische Forschungen</i> , 161-251 (1929)
Plaut., <i>Truc.</i>	Plautus, <i>Truculentus</i> . The Loeb Classical Library, V
Pud.	Le voeu de Puduḫepa. E. Laroche, <i>Revue d'Assyriologie et d'Archéologie Orientale</i> 43:55-78 (1949)
PY	Pylos Tablets (Bennett 1955)
RV	<i>Ṛgvedasamhitā</i> (Aufrecht 1955)
Supr.	<i>Suprasl'skaja rukopis'. Pamjatniki staroslavjanskogo jazyka</i> 2:1, ed. S. Sever'janov. St. Petersburg, 1904
T.B.	Tabula Bantina (Buck 1905:130ff.)
T.I.	Iguvine Tables (Poultney 1959)
Tel.	Telepinus myth (KUB XVII 10; KUB XXXIII 1-10); Order of King Telepinus (BoTU 23 A, B, C = KBo III 1 + KBo XII 5 + KBo III 68 + KBo XII 7)
Tun(n).	<i>The Hittite Ritual of Tunnawi.</i> A. Goetze, American Oriental Series 14. New Haven, 1938
UKN	Urartean cuneiform inscription (Melikišvili 1960)
Ull.	<i>The Song of Ullikummi</i> (Güterbock 1951-1952)
VBoT	<i>Verstreute Boghazköi-Texte</i> , hrsg. von A. Goetze, Marburg, 1930
Vd	Vidēvdāt (Avesta)
Y	Yasna (Avesta)
Yt	Yašt (Avesta)

Sans cesse l'ineptie absolue de la terminologie courante, la nécessité de la réforme, et de montrer pour cela quelle espèce d'objet est la langue en général, vient gâter mon plaisir historique, quoique je n'aie pas de plus cher vœu que de n'avoir pas à m'occuper de la langue en général.

The absolute inadequacy of current terminology, the need to reform it and show what kind of object language is in general, constantly spoils my enjoyment of history, although I have no deeper wish than to have no need to be concerned with language in general.

Ferdinand de Saussure
Letter to Antoine Meillet
January 4, 1894

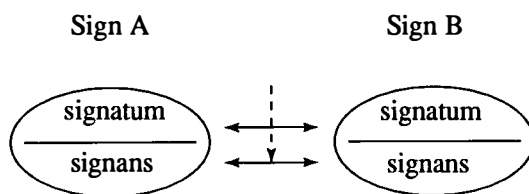
Introduction

The linguistic system and the premises of diachronic linguistics

0.1. The linguistic system of signs

Language as a system of signs distinguishes two structural planes: expression and content. Consequently, every linguistic sign unites two aspects: that of the signifier (*signifiant*, signans) and that of the signified (*signifié*, signatum), corresponding to the two planes. The relation between signifier and signified in the signs of language is determined by their interconnections in the system, on both expression and content planes. The interconnections on the two levels show the complex character of Saussure's principle of the arbitrariness of the linguistic sign. The linguistic sign is arbitrary as regards what may be called its *vertical relations*; that is, the connection of signifier and signified in any individual linguistic sign is arbitrary, unmotivated. However, the *horizontal relations* among signs, i.e. associations among signifiers and among signifieds of related linguistic signs, display elements of motivation in the sense that the nature of relations on the expression plane (similarities and differences in the phonemic composition of related signs) is motivated to some extent by the nature of systemic relations between these signs on the content plane (Gamkrelidze 1972, 1974a), as shown in Figure 1:

Figure 1



The expression plane is characterized by a complex internal structure. A linguistic sign is expressed (in spoken language) not by a single sound, but by a particular combination of sounds taken from the fixed inventory of sound units of that language. Hence the signifier of a linguistic sign has an internal hierarchical structure, which is defined as the *duality* of the sign. The distribution of

sound units among the signs of a language, the particular choice of sounds from the general inventory for the expression of a particular sign, is what constitutes the phonetic syntagmatics of language.

The fact that signs have internal structure makes it possible to create a potentially infinite set of signs using a limited set of elements, the phonemes of a language. Combining these signs according to particular structural schemes gives grammatically correct sentences in the language.¹

A system whose signs actualize all theoretically possible combinations of elements in the system up to a particular length may be described as *saturated*. A system which does not exploit all possible combinations of elements for the expression of signs can be described as *unsaturated*, having a certain amount of redundancy. It can be regarded as a system with restrictions on possible combinations of its elements. The admissible combinations of elements in such a system define the structure of its sign expression.

Natural language is an unsaturated system, one which has a fairly high degree of redundancy, a fact which enhances its communicative effectiveness. The same fact makes possible diachronic changes in the sound structure of natural language. Changes of phonemes into other phonemes, splits or mergers of phonemes found at earlier stages, are made possible by redundancy in the linguistic system. In a hypothetical saturated system with maximal entropy, where all possible combinations of elements could yield signs, a change of one phoneme series into another would necessarily lead to a shift of all other series in the system, in order to prevent signs from falling together and avoid massive homophony and distortion of communication. In unsaturated systems with some redundancy, like those of natural languages, transformations of the phoneme system — mergers and splits — do not result in complete identity of signs, which is why these processes are possible. Hence linguistic systems are not frozen with regard to sound changes and diachronic shifts of phonemes.

0.2. The interpretation of formal and semantic similarities among signs of different languages, and the concept of related languages

When similarities of form and meaning — simultaneous similarities of both

1. The duality of the linguistic sign is evidently a feature characteristic only of human language and not typical of animal communication systems. Animal communication utilizes 'signs', or signals, of elementary structure, usually consisting of only a single element (Hockett 1958, Benveniste 1974, 1966a). Hence the number of signs in such a system is determined by the number of distinct elements. Since the possibility for producing such distinct elements is limited (by physical and physiological constraints), the number of possible signs is correspondingly restricted. The only possibility available to such systems is the syntagmatic combination of signs, the construction of 'sentences' made up of individual signs by combining them into longer sequences.

signified and signifier in signs — are observed between two or more languages, the question naturally arises what caused such similarities in the signs of distinct languages. Assuming that the arbitrariness of the sign is restricted (in the sense given above), formal and semantic coincidence of signs in distinct languages — phonetic similarity of two or more signs together with semantic similarity and/or identity — could be interpreted as accidental.

It is entirely possible that completely accidental combinatory factors would lead to the appearance in two or even more languages of words which were close in both sound and meaning. It is even possible to calculate with a certain degree of accuracy the probability of two or more identical or similar words of a certain length appearing in two or more languages (see Polivanov 1931:180-81, Greenberg 1957:35ff.). The plausibility of chance coincidence as an explanation for similarity will decrease as the number of languages exhibiting the coincident signs increases; and it will decrease even further as the number of coincident signs in those languages increases.

Given coincident signs and a sufficiently high number n of those signs (on the order of 20-30 or more), and a number k of languages (where $k \geq 2$), the probability of chance coincidence is virtually zero and a different hypothesis is required for explaining the similarities. (The probability of chance coincidence also decreases with increasing length of the resemblant words: the longer the words, the less the probability of their chance identity.) Another, more plausible, hypothesis for explaining such resemblances is historical contacts between the languages and borrowing from one to the other (or others) or borrowing into both from a third source.

But not all kinds of form-meaning correspondences can be interpreted as due to borrowing. There is a type of similarity between signs of different languages which is revealed in regular phonemic correspondences between resemblant signs. This type of similarity cannot generally be explained by borrowing from one language into the other. Resemblances of this type require correspondences between the languages, such that for every phoneme x of language A there is a corresponding phoneme y in a formally and semantically similar sign of language B, a phoneme z in a similar sign of language C, and so on. Where phoneme x of language A corresponds instead to phoneme y' of language B, this can be explained as positionally conditioned by the phonemic context. In such cases we can claim that phoneme x of language A corresponds to phonemes y, y' of language B in all positions. Such sound correspondences among languages are usually observed in words and morphemes referring to the basic, fundamental concepts of human activity and the human environment.

This latter type of resemblance cannot be satisfactorily explained either as due to chance coincidence or as due to borrowing (from one language into another or into both from a third source). Its only plausible explanation is a common origin for the linguistic systems in question, i.e. the descent of the

systems from a common source system, which has undergone transformations in different directions.

On this understanding, the phoneme correspondences established between attested languages can be viewed as the result of different transformations of original phoneme units. As a result of the breakup of a language *L* into related dialects, a phoneme *X* in language *L* yields phoneme *x* in one dialect, *y* in another, *z* in another, and so on; when the dialects are compared, these phonemes are seen to be in a particular correspondence to one another.

When phonemes are viewed as particular complexes of phonetic features, the transformation of an original phoneme *X* can be seen as the replacement of one or several features in the complex by other features, yielding various transformations of the original phonemic unit. After such transformations the regularly corresponding phonemes that arise in dialects *A*, *B*, *C*, ... will naturally be phonetically similar to one another; indeed, this is what establishes their historical similarity. In some cases the 'transformation' of the source phonemes consists in the preservation of all phonetic features, i.e. the entire complex. In such cases the corresponding phonemes of the dialects will display phonetic identity and reflect the feature complex of the source phoneme.²

Thus the 'similarity' of corresponding phonemes in related dialects can vary from complete identity to considerable difference of the phonetic features; the latter points to a change in one or several features of the original complex. In this view, the term 'similarity' or 'resemblance' must be understood as referring to the presence of regularly corresponding phonemes, and not as phonetic coincidence or difference in the signs of the languages regarded as related.

The regularly corresponding phoneme elements of related languages are generally phonetically similar to one another. Their feature complexes coincide or differ only in one or two features; it is this partial or full coincidence of features that is responsible for their phonetic similarity. It is precisely in such

2. Since the system of phonemic correspondences between related languages also includes elements which are identical in the two languages, there is always the possibility that two cognate forms will turn out to consist entirely of phonemes in identity correspondences, so that the forms in the two languages will be identical. In such cases there may be doubt as to whether the forms are native and cognate or rather represent loans from one language to the other or into both from a third source. Cf. e.g. Hitt. *yugan* 'yoke; season, year' and Skt. *yugām* 'yoke; season, cycle'; Hitt. *turiya-* 'harness' and Skt. *dhūr-* 'harness, gear'; Geo. *da* 'sister' and Mingr.-Laz *da* 'sister'; Geo. *ca* 'sky' and Mingr.-Laz *ca* 'sky'; Geo. *txa* 'goat' and Mingr.-Laz *txa* 'goat'; and others.

There are no strict formal criteria for unambiguously deciding this question. But the length in phonemes of the lexical items gives some grounds for determining the probability of one or the other interpretation: the longer the words, the more likely that they were borrowed, while if they consist of a small number of phonemes they are likely to have descended from a common source language and to be cognate. The probability that the words consist entirely of phonemes which happen to be identical in the daughter languages decreases as the length of the words increases. In this respect the Indo-European and Kartvelian words given just above, with their restricted phonemic length, can be regarded as lexical correspondences going back to a single protoform, and not as borrowings.

phonetically similar units that the historically observed resemblance between corresponding signs which testifies to their common provenience is most perceptible.

However, correspondence sets of related languages can also include phonemes which are quite distinct from each other, with only a small portion of shared phonetic features. The resemblance between such elements, and hence their regular correspondence, can be historically established only when we have forms in which these elements appear together with others which are minimally different and hence phonetically similar. In the absence of such forms it would be very difficult or even impossible to establish resemblance, i.e. regular correspondences, between signifiers in different languages which may go back to a common source.

Therefore in principle there may be languages which in actual fact descend from a common source, resulting from the breakup of a particular linguistic community whose membership is difficult to establish because there is no observable phonetic similarity between signs of potentially related linguistic systems. Such languages may be in what is called a *remote relationship*, the result of transformation to the point of overall replacement in the original differential features.³

On the other hand, assuming loss of a certain percentage of the original vocabulary over a given time interval, after a certain period of time related languages could lose all originally cognate words and affixes. In such a case it would be impossible to establish the relatedness of the languages.

The regular correspondences among phonemes in different languages which give evidence of linguistic relatedness are sometimes also observable in words known to be borrowed from one language into another. In that case, the regular correspondences can be observed when one language has two distinct subsystems S_1 and S_2 , where subsystems are defined by their relation to another language (or languages). Ordinarily, such subsystems differ in the character of the words and morphemes they contain. Subsystem S_1 , with phonemes reflecting common provenience, contains basic vocabulary, grammatical morphemes, and affixes, while subsystem S_2 consists primarily of cultural terms whose meanings change with cultural development. It is possible to establish a rough list of universal semantemes, found in all languages, which should primarily make up subsystem S_1 and are usually absent from subsystem S_2 . In such instances the correspondences of subsystem S_1 are those pointing to common descent from a source

3. Establishing possible phonemic correspondences between systems which may ultimately be related but show great phonetic discrepancies amounts to establishing correspondences between groups of dissimilar phonetic units in signs with similar semantics, without regard to the phonetic resemblance or non-resemblance of those units. This can be done by sorting through a vast number of similar semantemes from a group of languages, a natural task for a computer. Establishing remote relationships in this way could become one of the research problems of computational linguistics.

system, while those of subsystem S_2 are due to regular phoneme correspondences which arise on borrowing from one language into the other.

In such cases we usually observe several correspondence subsystems, one for each language, pointing to borrowing from those languages at different times, whereas subsystem S_1 exhibits a single system of correspondences with all the other languages, and each of them has the same types of phonemic correspondences with the others. Subsystems of type S_2 generally contain fewer forms than the basic system S_1 , which marks S_2 as borrowed. However, in particular languages the total set of subsystems of the S_2 type may contain more words than the basic subsystem S_1 , although each subsystem of the S_2 type usually contains fewer elements than the S_1 set. The lexemes of S_2 may reflect borrowing from different languages or from one language at different times.⁴

By identifying such lexical groups in a language and establishing their phonemic correspondences to other languages we can separate the lexicon into a number of subsystems, one of which is the basic vocabulary set which manifests the primary phoneme correspondences with other languages and reflects their common origin. The large portion of the lexicon that remains consists essentially of words that entered the language later, after its removal from the common source language, as a result of contacts and interaction with other languages throughout the course of its subsequent development.

In some cases when languages are in constant and intensive contact leading to a lengthy period of bilingualism, there can be borrowings of a significant portion of the lexicon of one language into the other, and regular correspondences arise between words in sentences and morphemes within words. This leads to structural convergence and structural resemblances between the languages, which can be characterized as *secondary kinship* or *acquired kinship* (the 'allogenic relations' between languages of Cereteli 1968). Allogenic relations between languages can obviously arise due to convergence in the generative rules of languages in contact and the rise of a common unified generative system reflecting the two original contacting systems. When this kind of unification of generative systems occurs, there can be greater typological similarity between the languages in contact than between either of them and its genetic source.

In addition to allogenic kinship, there also exist *linguistic areas*, groups of unrelated languages or of related languages which separated from their source, underwent a long period of separate development, and then were reunited by contact in a common territory. Examples are the Indo-European languages belonging to the Balkan linguistic area, the Lithuanian-Polish-Belorussian

4. Subsystems for loans from related and unrelated languages can be distinguished. The subsystem of loans from a related language will itself contain a subsystem S_1 which reflects the common heritage. The subsystem of loans from an unrelated language will lack an S_1 subsystem.

frontier, etc. (Jakobson 1971a). Three kinds of linguistic areas can be distinguished: unions of related languages (e.g. the Scandinavian–Old English contacts), of unrelated languages (e.g. Uzbek and Tajik: see Polivanov 1968), and a mixed type involving both related and unrelated languages (e.g. the Armenian–Ossetic–Kartvelian interaction).

0.3. The common linguistic system and the means of reconstructing it. Typological verification of reconstructed models

When phonemic correspondences between languages are explained as due to their common descent from a source language, the source language must be reconstructed if the rise and transformations of the attested daughter systems are to be studied. Comparison of languages centered on establishing regular phonemic correspondences leads logically to the reconstruction of a linguistic model whose transformation in various directions has produced the attested daughter systems. Comparison of languages which does not have as its goal the reconstruction of a source system can be regarded only as a preliminary stage in the investigation of linguistic history (cf. Saussure 1915:299).

The history of related languages prior to their attestation in writing can be established only if all the diversity of the attested structures can be reduced to a common source model and the paths by which these systems arose and developed can be reconstructed, from the original stage to the attested ones. This approach to genetic comparisons and correspondences naturally raises the question of how the original system is to be reconstructed and by what linguistic methods (see Birnbaum 1977). It is assumed that the original linguistic model reconstructed by means of the appropriate linguistic method will be a first approximation to a linguistic system which actually existed in space and time and which broke up into attested daughter dialects. Comparison of these dialects makes it possible to postulate particular structural models which reflect the hypothetical ancestral linguistic system. Especially significant for such comparisons is the method of internal reconstruction, the reduction of alternating elements within one linguistic system to a single source.

Every level of language can be regarded as an aggregate of interconnected subsystems. On the lexical level, as mentioned above, semantic features can distinguish groups of words containing basic vocabulary for fundamental concepts common to all cultures: formally, these words are characterized by the fact that they exhibit formal correspondences to related languages; within the overall system such words are isolated to some extent and may display phonological and morphophonological features which distinguish them from the rest of the vocabulary. These features may be regarded as archaic, and they serve as the basis for internal reconstruction, that is, for reconstructing the period in the history of the language when the features in question were not an

anomaly but the norm and reflected productive processes which are diachronically explained as innovations. Delimiting an archaic subsystem of this sort is one of the basic prerequisites for comparing the language with other languages.

When reconstructing the original linguistic models which must reflect the system of the common source language, the linguist is faced with the methodological question of the reality of reconstructions and the extent to which they correspond to the actual language that existed in space and time and is taken as the source for the group of related dialects. If the reconstructions are taken to be real, this entails a number of methodological principles for comparative-genetic linguistic research. The foremost of these is the close connection of comparative-historical research with principles of linguistic typology and universals (or frequentalia: see Serebrennikov 1974). In this respect genetic, or comparative-historical, linguistics, the linguistics that establishes genetic relations among groups of languages and provides reconstructions of their source models, in principle forms a single discipline with structural typology and linguistic universals.

And in fact reconstructed protolanguages, if they claim to reflect actual languages that existed in space and time, must be fully consistent with typologically inferred regularities of language, regularities established inductively or deductively through comparison of many different linguistic structures. A linguistic reconstruction which is in conflict with linguistic universals of course cannot claim to offer reality in its reflection of a linguistic system that once existed.⁵ But even when reconstructions are consistent with synchronic language universals, this cannot serve as sufficient evidence that they are real and reflect an actual linguistic system proposed as a source for related languages. A necessary condition for reality of reconstructions is that they must be consistent with diachronic typological data, with schemas for the change of particular linguistic structures over time, as established by the study of historical facts

5. Linguistic typology is not only a means for checking the plausibility of reconstructions, but also often serves as grounds for positing plausible but unattested links in linguistic structure. For example, in some cases it is possible to reconstruct only some of the distinctive features (for instance, only the feature of syllabicity for vowel phonemes). But reconstructing the complete set of distinctive features is impossible unless we go outside of comparative-historical linguistics and bring in typological facts which make it possible to fill in some of the unreconstructible features. The laryngeals, posited by Saussure on the basis of morphophonological patterning, can serve as a good illustration of restricted reconstructibility of distinctive features of phonemes in the absence of typological data. Strictly speaking, the claim that Saussure reconstructed only an 'algebraic system' is untrue. He reconstructed the most essential features of the laryngeals, namely their syllabicity and nonsyllabicity (i.e. their sonant character) and aspects of their influence on adjacent vowels. Subsequent research into the 'laryngeal theory' amounted to filling out the set of features rather than establishing any qualitatively new constructs. The schematicity of Saussure's conclusions can be explained by the incomplete set of differential features in his reconstructed phonemes, which is often inevitable for exclusively internal reconstruction that takes no account of typological facts. Further specification of the nature and phonemic status of the laryngeals in the system became possible only with broader application of facts from typological comparison of languages.

from individual languages.⁶

Thus reconstructions can be considered real if they are consistent with two basic typological criteria: they must agree with synchronic typological universals and they must agree with diachronic typological universals (general schemas for change and transformation of languages). These two criteria may be regarded as necessary and sufficient conditions for the reality of a reconstruction, which can then be seen as reflecting a parent linguistic system which once existed in space and time. Typological verification, synchronic and diachronic, of linguistic reconstructions thus becomes one of the basic prerequisites for positing linguistic source structures, and an indispensable one for testing their plausibility.

Formulation of regular rules for deriving attested daughter dialects from a posited source system may be regarded as a way of describing the rise and transformation of the dialects, from their original common state to their historical attestations. In contrast, reconstruction of a linguistic protosystem is achieved by comparing attested related linguistic systems and moving backwards in time from later to earlier linguistic stages and typologically verifying each system. This process continues until we reach a linguistic stage from which all the attested related systems can be derived by means of a set of typologically plausible regular transformations; these transformations are what determine the *diachronic derivability* of the system. They lead from the original system to the later stages which are the result of structural transformations of the original one.

In their explanatory power, diachronic transformations — which derive attested linguistic forms from theoretical constructs which can be regarded as chronologically earlier stages of these forms, their archetypes — can be compared with the transformations of generative grammar, which derive observed surface elements from theoretically posited underlying forms which define the deep structure of language.

A description of diachronic changes by means of transformational rules is essentially a regular sequence of discrete steps each of which reflects one of the synchronic stages in the development of a language. The less the chronological distance between such steps, the more precise and adequate the description of the language's development and the account of its successive changes from the original system.

6. A diachronic typology of possible transformations at various levels should be primarily based on attested material. Historically attested changes are the domain of historical grammar and therefore no comparative-historical or diachronic grammar can be constructed without taking into account the data arrived at by historical grammar.

Historical grammar is based primarily on material attested in documents. This material, which comes from earlier stages of language, has to be rendered in a special phonetic-phonological transcription, which raises technical questions about the relation of writing to the phonemic inventory of a language and about how phonemes and phoneme sequences are reflected in various writing systems. Therefore, study of the relation of writing to language is an indispensable prerequisite for constructing a theory of diachronic linguistics (cf. Hoenigswald 1960).

In this sense a rule deriving an attested stage from a reconstructed one can be broken down into a series of successive rules which derive the final result of the transformation from a series of regular steps that reflect possible stages in the development from the original linguistic system to the later attested one. For example, a phonemic shift of x to y , where x is the postulated stage and y the attested one, can be represented as a series of successive transformations:

$$\begin{array}{ccc} x & \longrightarrow & x' \\ x' & \longrightarrow & x'' \\ & \dots & \\ x^{n-1} & \longrightarrow & x^n \\ x^n & \longrightarrow & y \end{array}$$

For example, a change of p to \emptyset can be represented as a series of changes in a feature bundle, one feature at a time:

$$\begin{array}{ccc} p & \longrightarrow & p^h \\ p^h & \longrightarrow & f \\ f & \longrightarrow & h \\ h & \longrightarrow & \emptyset \end{array}$$

Jakobson has noted the importance of making use of synchronic typology in linguistic reconstructions (1957a, 1963; cf. also Hjelmslev 1928), and this typological approach requires radical reconsideration of classical Indo-European comparative-historical grammar and a new interpretation of the linguistic correlations sought by that method, with an eye to the structural-typological verification and diachronic derivability of the system.

At the present stage in the development of linguistics, when one of the major concerns is structural typology and language universals, much of what is found in the traditional reconstructions of Indo-European can clearly be revised to bring the posited Indo-European protolanguage into agreement with the facts of typological linguistics. The adjustment of traditional Indo-European reconstructions to typologically plausible systems may entail a major reconsideration of the reconstructions.

Classical comparative-historical Indo-European linguistics was one-sided and restricted, since its reconstruction of Proto-Indo-European was based only on external comparison of the separate daughter systems, complemented in some theories by internal reconstructions based on relations within one system. No explicit attention was given to the linguistic plausibility of the model, in the sense of its typological consistency with possible linguistic structures. As a result, classical Indo-European linguistics postulated a source linguistic system which, since it contradicts synchronic typological facts, cannot be considered linguistically plausible.

0.4. Reconstruction of sound units as bundles or combinations of distinctive and phonetic features, and their hierarchical correlations in the system

When a phonemic inventory is reconstructed, the sound units posited for the language must be regarded as combinations of distinctive features which can be verified against linguistic typological facts. There are universal models for the combinability of features in a vertical sequence into simultaneous bundles. Some feature combinations are preferred over others, as is reflected in the high systemic and textual frequency of phonemes containing such combinations; other features have more restricted combinability, and this is reflected in the lower frequency of phonemes containing them. The latter include empty cells, or gaps in a paradigmatic system, which can be regarded as exemplifying difficult feature combinations.

Two basic types of feature combination can be distinguished in this connection: marked and unmarked. A marked combination is an unusual or rare one, as is shown by the low frequency and restricted distribution of a phoneme containing it. It may be entirely lacking in some linguistic systems, resulting in gaps in phonological patterns. A gap in a paradigmatic system can be regarded as a cell having the possibility of being filled by a phoneme with null frequency.

An unmarked combination is a normal and natural one, as is shown by the higher frequency and greater combinatory freedom of phonemes containing such combinations. Natural combinability of features is due to their articulatory and acoustic freedom to cooccur in a simultaneous (vertical) sequence. The result is a functionally stronger phoneme.

Thus the distinction of markedness and unmarkedness pertains not to the individual feature in combination with other features; rather, it is a property of the entire feature combination as a whole.⁷ The feature values of marked (*m*)

7. An understanding of markedness which ascribes hierarchical dependency not to individual distinctive features but to feature combinations comes close to the traditional understanding of Prague School theory, where markedness and unmarkedness are defined in relation to unitary phonemes, which are viewed as bundles of distinctive features. There is a principled difference, however, in that our view interprets markedness not as the presence or absence of the feature in a phoneme, but rather as a hierarchical relation determining the degree of usualness, naturalness, and cross-linguistic frequency of particular feature combinations. Markedness in this sense is applicable to all types of phonological oppositions, not only privative but also gradual and equipollent (in terms of Trubetzkoy's classification). Hence the terms *marked* and *unmarked* depart from their original etymological meanings (*merkmalhaltig* 'having [a] feature', *merkmallos* 'featureless') to acquire a new sense of unusual vs. usual feature combinations.

Functionally strong, stable feature bundles (or phonemes), usually defined as unmarked in opposition to marked, functionally weak, unstable feature bundles or phonemes, can be renamed *dominant* bundles (contrasting with *recessive*). This reformulation in terms of paradigmatic dominance and recessiveness is desirable in view of the polysemy of the traditional terms *marked* and *unmarked*, which continue to be used in their original meanings (Gamkrelidze 1979). The terms *dominant* and *recessive* are taken from contemporary molecular biology, a field which, as is known, makes considerable use of linguistic terms for describing the structure of the

and unmarked (*u*) pertain not to the individual feature *F*, yielding [*mF*] and [*uF*], but to the whole feature bundle (Gamkrelidze 1975:23):

$$m \begin{bmatrix} \alpha F_1 \\ \alpha F_2 \\ \vdots \\ \alpha F_k \end{bmatrix} \quad \text{or} \quad u \begin{bmatrix} \alpha F_1 \\ \alpha F_2 \\ \vdots \\ \alpha F_l \end{bmatrix}$$

Such restrictions on combinability of features are based on properties of the human articulatory apparatus and on the psychological and physiological possibilities of speech perception. Taking these characteristics of speech into consideration, we can determine which feature combinations are articulatorily and acoustically optimal (phonologically, these will be the unmarked combinations) and which are non-optimal (phonologically marked): see Greenberg 1966, Postal 1968:170ff.

Hierarchical dependencies obtain between individual phonological units — feature bundles — and are revealed in dominance relations; this shows that there is a strict stratification of phonological values in the linguistic system.

We also find diachronic phonemic transformations in language, in accord with these universally significant correlations. A number of diachronic phonological changes which at first glance seem unconnected can be seen as interdependent and mutually conditioned, determined by the hierarchy of phonological values.⁸

A phoneme, which is a bundle of differential features, is realized in speech as a sound unit whose inventory of phonetic features is usually larger than the set of distinctive features it carries as a phoneme. The distinctive feature bundle becomes more complex in its phonetic realization, where it acquires additional phonetic properties. This is one of the differences in the expression plane between *language* and *speech* in the sense of Saussure and Trubetzkoy. In a strictly phonological transcription, which reflects only the phonologically relevant features, these additional phonetic properties should not be shown. However, their significance in the realization of phonemes in speech, as well as in sound changes, makes it imperative that they be taken into account in any linguistic description.

Two types of phonetic features must be distinguished: combinatorily conditioned ones, which can be deduced from the phonological features of the

genetic code (see Jacob 1977).

8. A universal hierarchy of phonological units implies, as noted above, the possibility that there will be phonemes with low or zero frequency (empty cells). Such systemic paradigmatic regularities should always be borne in mind, for both synchronic and diachronic description and in particular for reconstructions. An empty cell is not an anomaly from the point of view of markedness theory, and consequently the absence of external comparative data does not require that it be filled in internal reconstructions, as is often done in diachronic linguistics (for instances involving filling of *cases vides* see Martinet 1955, 1960).

context, and non-combinatory ones, which are imposed on the feature bundle in the phonetic realization of the phoneme. As an example of a non-combinatory phonetic feature, voiceless stops in many languages (Semitic, Kartvelian, and others) are realized as aspirated. Aspiration is a phonologically non-distinctive feature but plays an essential role as a phonetic feature in the realization of the voiceless stops.

Synchronically, the phonetic features are relevant not for the system of generative rules of the language, but for its realization in speech (see Pilch 1968:57ff.). Sound changes obviously involve interaction of phonological and phonetic features. Phonologically superfluous features can determine the direction in which phonemes change. This is why it is important to take account of phonetic features in describing diachronic phonological changes.

In diachronic as well as synchronic phonemic transcription, then, the phonetic features which are essential to realization and to determination of the direction of diachronic phonemic changes should be reflected insofar as possible. It is expedient to use a combined feature transcription which utilizes both phonemic differential features (set in Roman type) and the accompanying phonetic features (italicized). For instance, in languages where aspiration is a secondary phonetic feature, /p/ can be represented as the following feature complex:

$$\left[\begin{array}{l} \textit{[aspirated]} \\ - \textit{syllabic} \\ + \textit{nonsyllabic} \\ + \textit{stop} \\ + \textit{voiceless} \\ \textit{labial} \end{array} \right]$$

In place of this full transcription it is simpler and more convenient to make use of a shortened form, using a single symbol rather than a feature complex, with the additional phonetic feature as a superscript: p^h instead of the above feature complex. Similarly, it is simpler to express phonemic changes as changes in only the features that differ, without repeating the features that do not change. (The same obviously applies to the synchronic representation of similar phonemes, in which shared features need not be repeated.)

When we have full feature matrices where all phonemes are described exhaustively in terms of differential features, their diachronic changes and synchronic oppositions can be expressed in abbreviated form with a single symbol, and the changes of features can be derived from the phoneme matrices. This is partly similar to classical comparative practice, except that the latter did not differentiate between phonological changes of phonemes and phonetic

changes of individual sounds.⁹

On the other hand, where we have identical, symmetrical shifts of whole phoneme series, it may be more economical to rely on a transcription using changes of one or more features rather than writing an individual abbreviated symbol for each phoneme taking part in the change (see Halle 1962). For instance, the following shift of a series

$$\begin{array}{lcl} /bh/ & \rightarrow & /b/ \\ /dh/ & \rightarrow & /d/ \\ /gh/ & \rightarrow & /g/ \end{array}$$

can be more economically represented with a single feature rewrite rule:

$$[+ \text{ aspiration}] \rightarrow [- \text{ aspiration}] / \left[\begin{array}{c} \text{---} \\ +\text{stop} \\ +\text{voice} \end{array} \right]$$

That is, the feature of aspiration with a plus value receives a minus value in the paradigmatic context of the features of stop and voicing.

Defining the phoneme as a feature bundle brings us to the question of what the distinctive features that represent the phoneme are. Phoneme representations in terms of primarily articulatory features have recently replaced the acoustic features that were more popular during the early rapid growth of spectrographic analysis. A strictly acoustic definition of distinctive features often led to an inadequate account of the articulatory properties of the phonemes. The importance of articulatory properties, not only for the formation of phonemes but also for their perception, is supported by a growing number of recent works (see Čistovič 1961, 1965, Liberman 1957, Ladefoged 1971, and others). Therefore it makes sense to select as distinctive features those articulatory features that define the essential properties of a phoneme, including acoustic features as necessary, provided the articulatory and acoustic features do not exclude each other. A feature inventory that does take account of articulation is preferable to an exclusively acoustic one.

Below, distinctive features will be described primarily in articulatory terms and will be based on features proposed in the literature, with some modifications (e.g. Jakobson, Fant, and Halle 1962, Jakobson 1971a, Chomsky and Halle 1968:93ff.).¹⁰

9. For reconstructed stages these phoneme matrices can be established by comparing typological data to the results of a distributional analysis of the phonemes in a synchronic slice of the reconstructed stage.

10. Instead of the features [\pm vocalic], [\pm consonantal], which are tautological when vocalic and consonantal phonemes are defined, [\pm syllabic], [\mp nonsyllabic] are used, based on the ability of segments to form syllable peaks, i.e. to function in a sound sequence as syllable-forming (central) or non-syllable-forming (marginal). Vowels will therefore be described as [+ syllabic, – nonsyllabic], consonants as [– syllabic, + nonsyllabic]; sonorants (sonants), which

0.5. Principles of semantic reconstruction

Reconstructing a language means reconstructing not only its phonemes and their correlations in a paradigmatic system, but also whole sequences of phonemes and combinations of them that yield morphemes, words, and phrases expressing particular grammatical or lexical meanings. It means reconstructing not only the expression plane but also the content plane, the meanings of forms and syntactic constructions.

While in formal reconstruction the investigator starts with a system of phoneme correspondences and postulates typologically verifiable source forms and archetypes, semantic reconstruction is complicated by a lack of formal criteria for positing source semantemes, i.e. for positing a content plane for the reconstructed protoforms — words and word combinations. The simplest case, as with formal reconstruction, is when formally corresponding words are close in meaning. Then the meaning common to those words — the set-theoretical intersection of their semantic differential features — can be reconstructed. When there are converse relations, as with ‘give’ and ‘take’, ‘buy’ and ‘sell’, the reconstruction posits a semanteme in which the opposed features are neutralized. The converse pair ‘buy’ and ‘sell’ can be reduced to a generalized term for exchange, comprising both buying and selling. This is analogous to the concept of neutralization in phonology and morphology. Thus what is reconstructed is not the concrete meaning of an individual word, but a situation in terms of which the meaning can be described (see Benveniste 1966a, 1974); compare contemporary works on linguistic semantics, where the meanings of words are described by means of meaning-preserving transformations of whole sentences.

A typology of semantic changes acquires particular significance for such reconstructions. Posited changes increase in probability as similar semantic changes are observed in the histories of individual languages or language groups.

0.6. The reconstructed linguistic system in space and time

A reconstructed linguistic model reflects a protolinguistic system which once existed, and the time frame within which it existed and changed must be reconstructed, as must the geographical aspects of its spread. If a protolanguage is regarded as a system which existed in space and time and had a history, then the dynamics of its evolution must be studied and account must be taken of its earliest scientifically recoverable stages and its history up to its breakup into

could be syllabic or not depending on context, will be defined as [+ syllabic, + nonsyllabic]: see Gamkrelidze 1975.

daughter dialects and their formation as independent linguistic units.

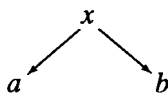
Many structural properties of Proto-Indo-European which are reconstructed in classical Indo-European studies as static schemas can be broken down into chronological stages. Features which are reconstructed for an undifferentiated source system often do not belong to the late period of its development and dialectal differentiation but reflect an earlier stage. This explains the frequent debates in Indo-European comparative grammar over linguistic structures that appear mutually exclusive; an example is the discussion of the number of laryngeals in Indo-European, where each of the several incompatible solutions has good evidence in its favor. In such instances the various solutions can be associated with different developmental stages of PIE, which permits us to regard many of the proposed structures as chronologically complementary and datable to different stages.

The motionless, static PIE scheme must be replaced with a chronologically dynamic system, one which, like any attested language, had its history and evolutionary dynamics. That history presupposes both internal evolution of the system and areal associations with other systems, reflected in contacts and interference. In this respect we can speak of linguistic borrowings into PIE from other languages and from PIE into other languages which were in contact with it.

Like any real language, the system of a reconstructed language must be understood to have existed as a set of interconnected dialects. Its breakup into historically attested cognate languages can be seen as the gradual differentiation and fragmentation of what were originally dialects of a common source linguistic system. Within the reconstructed system, therefore, individual subsystems can exhibit differences in phonological and morphological features which reflect dialect differentiation of the reconstructed language. In a model reconstructed for a particular chronological period, dialect differentiation takes the form of variant, or doublet, forms; these can reflect areal, dialectal oppositions within the common system at a late stage. They can in turn be explained chronologically in terms of the history of the common language (see Stepanov 1979). On this view, the dialect differentiation and breakup can be seen as a doubling of original structures which subsequently develop in different directions.

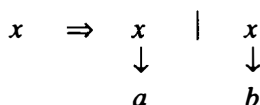
Any element *x* of the original system subsequently yields elements *a* and *b* in two related languages. This can be schematically represented in the form of a tree (an oriented graph):

Figure 2



This is the result of a split of the original element into two dialect forms and the subsequent transformation of each of the dialect forms into the resultant attested units:

Figure 3



This is illustrative of the development not only of individual elements of the system, but also of the entire system.

The genealogical tree which represents the descent of individual languages from a protolanguage in traditional comparative linguistics is in essence a model reflecting the final results of these transformations of the original system. It actually reflects relations among units already formed, and indicates only the direction of evolution from the original system. In this respect the genealogical tree is not in contradiction to the wave theory, which models the rise and spread of innovations in language but does not show the final results of differentiation into separate dialects. Therefore there is no reason to oppose these two schemas and judge their relative merits and shortcomings. Each is incomplete, since they only reflect different aspects of the rise and development of linguistic structures from a source. They should therefore be united as complementary schemas for diachronic change of languages.

Insofar as comparative-historical, or diachronic, linguistics relies on a concept of the source linguistic system as a union of distinct dialects which existed in space and time, it is linked to the theory of formal relations between languages — structural typology and language universals. It also has some affinity in theory and methods to the theory of linguistic relations in space — linguistic geography, areal linguistics, language contacts.¹¹

11. Diachronic linguistics has interesting links with structural dialectology in the sense of Weinreich 1954. Weinreich's *diasystem* is precisely the result of reconstructing a common system for dialects. On this view, comparative dialectology coincides with comparative-historical linguistics in its approach to the tasks of diachronic reconstruction. The diasystem of structural dialectology is more a diachronic and/or metalinguistic concept than a synchronic one. Therefore it cannot be regarded as a real communicative system for speakers of the dialects. What makes it possible for speakers of different dialects to understand each other is not mastery of a diasystem but knowledge of the rules for dialect switching — rules requiring that correspondences between the dialects be viewed as existing on several levels. However speakers of another dialect may assess these correspondences, they consider them to be distortions vis-a-vis their own dialect. It is knowledge of these correspondences that constitutes the rules for dialect switching.

To some extent this criterion can serve as grounds for distinguishing dialects from languages. Speakers of related languages, unlike speakers of related dialects, evidently do not know the correspondences between the languages, and hence they have no rules for language shifting. Ordinarily they regard the languages as unconnected independent systems.

0.7. The original territory of the common language and the migratory routes of speakers of its dialects. The problem of identifying linguistically reconstructed cultures with archeologically reconstructed ones

A group of related languages is formed when an original linguistic system disintegrates due to disruption of contacts between speakers of individual dialects; the languages are spread to their historically attested territories by migrations of the speakers. This means that the original range of the common source linguistic system lay in a particular area, an area more compact than the range of the daughter languages, from which the out-migrations originated. The size of the territory and the gradual dissolution of the community both depend on the culture, the geography, and the ecological conditions of the tribes that spoke the common language. Thus identifying the original range of a reconstructed language and identifying the migratory routes of the tribes speaking its dialects are the historical and geographic side of the specifically linguistic problem of dissolution of linguistic unity.

That the original territory was more compact than the range of the daughter languages is confirmed by typological facts which show historically attested spreading of related languages and settlement of larger territories by their speakers. Within the larger range we can distinguish a more compact area settled by speakers of archaic dialects which are linguistically closest to the original system (see Bartoli 1925, Sapir 1958, Ivanov 1958, Schlerath 1981).

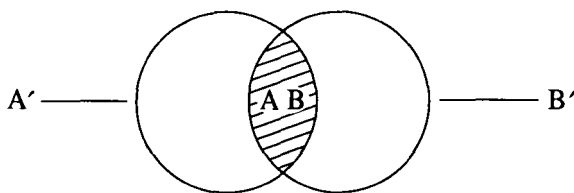
The Indo-European languages, presently spread over a broad range in Eurasia, must have originated in a more compact original Proto-Indo-European territory. Identification of that territory is the essence of the traditional problem of the Indo-European proto-homeland. It will make it possible to reconstruct a picture of the migrations of the ancient Indo-Europeans, the tribes speaking Indo-European dialects, to their historical territories, and thus to establish the dynamics of areal associations among the Indo-European daughter languages.

Determining the homeland requires, first of all, that we establish an absolute chronology, at least an approximate one, for the migrations. This can be done by demonstrating affinities between the linguistically reconstructed culture of the proto-speakers and particular archeological cultures. This leads to the question of how one correlates linguistic data with archeological and historical cultural data. Specifically, it raises the question of whether a particular linguistic community can be correlated with a particular archeological culture. Presumably a linguistic system can be correlated with a culture if the culture yields the same realia as the language does: the realia are identical in their elementary composition and the interconnections among the elements are identical.

Fulfilling this task requires working out a typology of archeological cultures, with implicational relations between individual units of material culture.¹² If the implicational rules for a culture coincide with those for the culture reconstructed from linguistic data, then the identification of the two cultures becomes more plausible. Certain elements and features of the cultures may fail to coincide, but the essential requirement is that whole complexes coincide and there are no incompatible traits.

Since the reconstructions — both linguistic and historical — are necessarily incomplete, failure of individual components to coincide is no obstacle to their historical identification. With limited and incomplete reconstructions, the size of the one complex (A, reconstructed linguistically) can be either greater or less than that of the other (B, established archeologically). We can also have intersection of the complexes, with a larger or smaller portion of either the archeological culture B' or the linguistic culture A' outside the common part AB, as shown in Figure 4. It is essential that the non-coinciding parts A' and B' not contain features which are incompatible in view of implications internal to the two complexes (as for instance if an element of A entailed that the entire reconstructed system A contain some feature which is incompatible with a feature which either is reconstructed for part B or is implied by other elements in B).

Figure 4



When the question of the original territory of the common language and the identification of its linguistically reconstructed culture with an archeological culture is posed in this way, the task of the linguist is to provide a systematic semantic analysis of all reconstructed words and phrases which point to individual features of material and intellectual culture that can typologically

12. Similarly, if a typology of archeological cultures is to be established there must be agreement on a unified description and inventory of cultural artifacts (see e.g. Gardin 1965, 1983, Kameneckij et al. 1975). A unified inventory is a necessary precondition for typological comparison of different cultures.

distinguish this culture from others. That analysis requires that the reconstructed words and phrases be linked to denotata and that the cultural-ecological and historical-geographical characteristics of those denotata be determined.

This section has proposed principles for analyzing language and the phenomena of its speakers' intellectual and material life which are connected with and reflected in language. These principles will be used below to set forth the system of the Proto-Indo-European language (Part I) and the Proto-Indo-European culture (Part II), their interconnection, and their typological connections with languages and cultures of historically adjacent areas.

Part One

The Structure of Proto-Indo-European

Section One

The Phonological System and Morphophonology of Proto-Indo-European

Si le seul moyen de reconstruire est de comparer, réciproquement la comparaison n'a pas d'autre but que d'être une reconstruction. Sous peine d'être stériles, les correspondances constatées entre plusieurs formes doivent être placées dans la perspective du temps et aboutir au rétablissement d'une forme unique.

The sole means of reconstructing is by comparing, and the only aim of comparison is a reconstruction. Our procedure is sterile unless we view the relations of several forms from the perspective of time and succeed in re-establishing a single form.

Ferdinand de Saussure, *Cours de linguistique générale*
(transl. Wade Baskin)

Typological verification raises the probability of reconstructed phonemic and morphological patterns, and permits changing the reconstruction from a mere numerical catalogue into a more realistic portrayal of the linguistic system.

Roman Jakobson, *Typological studies and their
contribution to historical comparative linguistics*

Chapter One

The three Indo-European stop series: Paradigmatics and syntagmatics

1.1. The three stop series in Indo-European and the problem of the defective labial inventory

1.1.1. The traditional system of Proto-Indo-European stops

For late Proto-Indo-European, the stop system is traditionally reconstructed with three manners of articulation, or *series*,¹ and four points of articulation, or *rows*.² The series comprise phonemes which are homogeneous but heterorganic, and the rows are homorganic but heterogeneous (Martinet 1955:III.8). The three stop series are traditionally characterized as voiced (*mediae*), voiced aspirate (*mediae aspiratae*), and voiceless (*tenues*), and the four points of articulation as labial, dental, velar, and labiovelar (see Table 1).

Table 1
The traditional system of Indo-European stops

I	II	III
(b)	bh	p
d	dh	t
g	gh	k
gw	gwh	kʷ

1. This refers to the most widespread view of PIE consonantism, as set forth, for example, in Lehmann 1952. Earlier works reconstructed a fourth series of voiceless aspirates, but most investigators beginning with Saussure (1892) have rejected the fourth series as a late development (see Pedersen 1951).

2. The full system of Indo-European stop points of articulation will be discussed below in a separate section dealing with the problem of whether Indo-European had palatovelar and labiovelar stops as well as plain velars. The question of how many phonemically distinct dorsal points of articulation there were is an essential one in reconstructing the full system of Indo-European stops and establishing the transformations it went through in the formation of the daughter languages, but it is irrelevant to determining the phonological nature of the three manners of articulation. The features that distinguish the three stop series are not directly relevant to the phonology of the dorsal phonemes. For an investigation of the three stop series, it is sufficient to have information for only three sets — labial, dental, and velar — without regard to the further subdivision of the velar set. Therefore, in the phonological transcription used below (up to the section of Chapter 2 dealing with the number of dorsal sets) a single symbol will designate palatovelar and plain velar consonants indifferently (the traditional transcription is *g* vs. *ḡ*, *gʰ* vs. *ḡʰ*, *k* vs. *ḱ*).

In the traditionally reconstructed system there is an asymmetry in the labial series. It was pointed out by Pedersen (1951) that the voiced bilabial ***b** is absent, while there are many examples with ***g** and ***d**. Pedersen rejects as dubious all the cognate sets usually adduced in support of PIE ***b**. Specifically, he shows that of three forms usually regarded as cognate, Skt. *bálam* 'strength', Gk. *beltíōn* 'better', OCS *bolījī* 'more, to a greater extent', only the Sanskrit and Slavic forms can actually be cognate, and only if Skt. *bálam* is not a Dravidian borrowing (Burrow [1955]1976:358, 360, 374). There is an almost complete absence of forms which uncontroversially go back to ***b** (cf. Hamp 1954:40).

Non-initial PIE ***b** has so far been found (Szemerényi 1970:51, §7.1.2) only in two forms. One is Goth. *diups* 'deep', Lith. *dubūs* 'deep, hollow', OCS *dūbrī* 'gorge, ravine, canyon, glen', Gaul. *Dubno-rīx* 'King of the world', OIr. *domun* 'world'. This correspondence set is attested in only one Indo-European dialect group, a western one, and the only evidence for its manner of articulation comes from Germanic. It could be that the voiceless ***p** of Gothic and other Germanic languages is the result of positional devoicing of *b* from ***bh**. It is significant that the very similar Gk. *buthós* 'depth, gulf, abyss' points to a doublet set ***budh-** / ***bhudh-**, probably with metathesis of the original voiced consonants: cf. Gk. *puthmén* 'depth' (Chantraine 1968:I.201). These forms do not provide indisputable evidence for reconstructing a non-initial PIE ***b** (see Trubačev 1978:5.175).

The other possible cognate set showing ***b** is Icel., Norw. *slapa* 'limp, slack, drooping', OCS *slabŭ* 'weak', Lith. *slobstū, slōbti* 'become weak', usually compared to Lat. *labor, lapsus* 'slip, slide' (Pokorny 1959:655). Here again we have an areally restricted correspondence, pointing to a late origin for these forms, which are therefore not Proto-Indo-European.

However, even if we admit a PIE ***b** in the forms just examined, we cannot fail to note the striking quantitative discrepancy between forms with PIE ***b** and those with ***d** and ***g**. Based on a count we made of Pokorny, ***d** and ***g** occur over 250 times each in Proto-Indo-European words.³

The claim that IE ***b** was a 'weak' phoneme has recently been argued against by Djahukian 1982. Djahukian does not mention Pedersen 1951, which deals precisely with this topic; and his understanding of the comparative-historical and

3. These statistics differ from those of Jucquois 1966:61 and 1971, where the frequency of *d* is 83 and that of *g* is 70 (while that of *b* is 31). The difference is evidently due to the fact that Jucquois's frequency counts of Pokorny, unlike ours, were based only on root morphemes (as the root is defined by Benveniste). The frequencies of phonemes based on Pokorny obviously do not accurately reflect Proto-Indo-European frequencies, since Pokorny includes not only Proto-Indo-European material but also recent forms that arose in the separate branches. Hence the frequency of *b* in Indo-European forms based on Pokorny is much higher than the actual number of ancient Indo-European forms containing ***b**; the possible examples of ***b** have been surveyed above. Our count of Pokorny yielded 78 instances of *b*, as against Jucquois's 31. But even for these figures, based on all forms (Proto-Indo-European and later) in Pokorny, the relative frequencies are revealing: the frequency of ***d** and ***g** is significantly greater than that of ***b**.

typological issues involved is not entirely correct. The issue is not the complete absence of voiced stops from Proto-Indo-European, since the traditional voiced aspirates must have been voiced stops; rather, it is the phonological interpretation of the stop series traditionally reconstructed as plain voiced (and in which the labial member was either missing or extremely infrequent).

Erhart 1984 also rejects the voicelessness of Series I on the grounds that the so-called voiced-voiceless opposition is very old in the Indo-European stops. He fails to note that the proposed reinterpretation of the traditional voiced stops as voiceless in no way removes the voicing opposition from the Indo-European stop system but merely redistributes it, transforming the system into one where Series II represents voicing and the other two are voiceless.

1.1.2. Pedersen's reinterpretation of the traditional system

Pedersen established the absence or near-absence of ***b** in Proto-Indo-European and on that basis first raised the possibility of reinterpreting the traditional voiced stop series as unvoiced (or voiceless). A language which lost *b* while preserving *d* and *g* seemed improbable to him, while there are many examples of languages which lose *p* while preserving *t* and *k*. On this basis, Pedersen proposed a reinterpretation of the traditional reconstruction that was daring for its time: the voicing values for the traditional Series I and III were reversed, so that Series III was now voiced and I voiceless, while Series II was seen as possibly voiceless aspirated (see Table 2).

Table 2

Traditional system			Pedersen's system		
I	II	III	I	II	III
—	<i>b^h</i>	<i>p</i>	—	<i>p^h</i>	<i>b</i>
<i>d</i>	<i>d^h</i>	<i>t</i>	<i>t</i>	<i>t^h</i>	<i>[˙]d</i>
<i>g</i>	<i>g^h</i>	<i>k</i>	<i>k</i>	<i>k^h</i>	<i>g</i>

Pedersen regarded the consonant system he had posited as early Indo-European or pre-PIE (*Vorindoeuropäisch*). It changed into the traditionally reconstructed system of Proto-Indo-European (*Gemeinindoeuropäisch*). As a typo-

logical example he adduced the development of voiced and voiceless consonants in the eastern and western dialects of Armenian (Pedersen 1951).

Pedersen's procedure for transferring his reconstructed 'early Indo-European' system into the traditionally posited PIE system was dictated by the difficulty of deducing the attested consonant systems from the system he proposed. Although the traditionally reconstructed system is contradicted by synchronic typological data (as was first noted by Pedersen), it nonetheless has the property of diachronic deducibility: the historically attested Indo-European consonant systems can be derived from it easily and without contradiction, utilizing typologically verifiable sound changes (i.e. changes supported by the historical development of many attested languages).⁴

The change of Pedersen's pre-PIE system into the traditional PIE system leaves the traditional view of Indo-European consonantism essentially intact, since all the Indo-European languages are derived from the traditional system, the one with synchronic typological contradictions. Hence Pedersen nullifies his own reinterpretation, turning it into a mere appendage to the traditional consonant system. This is undoubtedly the reason why, except for a few isolated observations,⁵ his line of inquiry has not been followed up in subsequent Indo-European comparative grammar.⁶

There have been recent attempts to ascribe the reinterpreted system to a pre-PIE stage which then subsequently changed into the traditional system from which the daughter languages can ultimately be described, e.g. Haider 1982. Haider corrects the typological weaknesses of the traditional system by proposing a 'pre-IE' consonantism consisting of preglottalized voiced, plain voiced, and plain voiceless consonants; these shifted in PIE to respectively plain voiced, voiced aspirate, and voiceless (aspirate) as a result of 'intensification' (*Stärkung*). It is not clear what kind of phonetic process is meant by 'intensification', which shifted the plain voiced series into highly marked voiced aspirates. Nor does positing preglottalized voiced stops in place of the traditional plain voiced stops remove the typological obstacles of the traditional system (absence or weak representation of *b and high frequency of the voiced velar; absence of roots with two voiced stops; etc.), since preglottalized voiced stops, in contrast to glottalized voiceless stops, have the very same markedness relations — dominant labial, recessive velar — as plain voiced stops (see Greenberg 1970:125).

4. This may have been one of the reasons why the traditional Indo-European consonant system was so long accepted as the source of the attested systems, despite the fact that on further inquiry it turns out to be contradictory from the viewpoint of synchronic typology.

5. See Martinet 1953b:70. Martinet proposes an original interpretation of the traditional voiced series as glottalized; see below. Pedersen's model is adopted by I. Melikišvili 1971:216, except that the traditional voiced stops are replaced not by voiceless (nonvoiced) stops but by aspirated (rather than glottalized) stops, since aspirates are more marked than plain voiceless stops.

6. Only very recently have alternative models begun to be proposed, based on considerations of simplicity in description (see Emonds 1972).

This approach (and others like it) represents an attempt to save the traditional stop system at any cost. But the traditional system is only a reconstructed model, posited on the strength of theoretically interpreted correlations among historically related languages, and not a historically attested system; hence it is a hypothesis like any other. Even a time-honored theoretical construct like the classic PIE consonant system can be replaced by an alternate model supported by the most recent findings, when justified by the overall development of comparative-historical and typological studies in contemporary linguistics.

1.2. A typological interpretation of the three Indo-European stop series

1.2.1. Inconsistency of the traditional Indo-European stop system with the facts of phonological typology

The traditional picture of Indo-European consonantism was drawn up at the dawn of Indo-European comparative grammar and largely coincided with the consonant systems of the languages with ancient written traditions: the classical languages, Greek and Latin, and especially Sanskrit. These languages had great prestige, and — as has often been the case in comparative Indo-European grammar — effectively determined the shape of the reconstructed system. Linguistic systems displaying differences from the prestige languages were explained as having changed from an original system essentially identical to those of the languages with ancient traditions. This is why Grimm, who following Rask established the correspondences between Germanic and the classical languages, regarded the Germanic system as due to a shift (*Lautverschiebung*) of the original Indo-European phonemes. This view, passed on from generation to generation of Indo-Europeanists, dominates the comparative grammar of Indo-European languages to this day.

It can easily be seen that this picture is not the result of principled linguistic analysis, but is rather the product of historical accident due to the prestige of languages with ancient literary history. The structures observed in these languages were projected for Proto-Indo-European antiquity, while the structures of the other Indo-European languages were viewed as transformations and restructurings of the Proto-Indo-European system.

An inconsistency in this approach arose fairly early in relation to the Indo-European vocalism: Sanskrit vocalism proved to be secondary compared to that of other Indo-European languages, hence not representative of the Proto-Indo-European situation. However, there was no doubt in the minds of most scholars

as to the Proto-Indo-European nature of the Sanskrit stop system (and, in part, Greek and Latin consonantism).

Although the traditional Indo-European stop system offers diachronic deducibility, it lacks consistency with the facts of synchronic typology. The inconsistency pertains most saliently to the absence (or extremely low frequency) of voiced labial **b* in Series I. According to synchronic typology (see Greenberg 1966, 1970, Hamp 1970a, I. Melikišvili 1972, 1974, 1976, Campbell 1973), in systems with a voicing opposition in stops the marked (i.e. recessive) point of articulation in the voiced series is *g*, and *b* is unmarked (i.e. dominant); while in voiceless series *p* is recessive and *k* is dominant. These markedness relations determine the relative frequencies of phonemes and gaps in stop systems. The recessive member of the opposition generally displays lower frequency than the dominant one. In many systems that low frequency is equal to zero, which creates a gap in the phonemic system.⁷

Consequently we can expect the following types of stop systems (see I. Melikišvili 1972):

(A)			(B)			(C)		
<i>p</i>	<i>t</i>	<i>k</i>	—	<i>t</i>	<i>k</i>	—	<i>t</i>	<i>k</i>
<i>b</i>	<i>d</i>	—	<i>b</i>	<i>d</i>	<i>g</i>	<i>b</i>	<i>d</i>	—

In such systems the recessive phonemes — the voiced velar *g* and the voiceless labial *p* — are absent or extremely rare.⁸

7. The impossibility of a gap in the voiced labial series and the probability of such a gap in the voiceless series are confirmation of Pedersen's opinion, expressed as a diachronic claim for the impossibility of loss of the voiced labial *b* and the frequency of loss of voiceless *p*. The significance of Pedersen's claim in the light of Greenberg's typological observations has already been noted in Hamp 1970a.

8. Lifu is sometimes adduced as an example of a systemic gap of *b* and a counterexample to the claim that the voiced labial *b* is unmarked in comparison to the velar *g* (Martinet 1955:III, 36, 1960:123-24, 137). The gap is established historically by Lenormand 1952, on the grounds that /*b*/ is found in loan words from European or neighboring Melanesian and Polynesian languages, while /*d*/ and /*g*/, as well as /*p*/, /*t*/, and /*k*/, are found in native words. However, this argument does not reflect the actual diachronic situation, since it does not take into consideration the origin of the Lifu voiced stops. According to Haudricourt (1971:380-84, 392-93, and correspondence tables 30 and 31), the contemporary Lifu voiced stops were seminasalized until recently: Lifu *ɖən* 'leaves' < *ɖəu*, Fijian *ɖəu* (*ɖ* is a seminasalized cacuminal stop), Lifu *maɖa* 'blood', Fijian *ɖaa*. Parallel to the reconstructed development of *ɖ* > *ɖ* and *mb* > *b*, a development of **p* > *h* > *Ø* (-*w*- intervocally) is proposed (cf. the development of -*p*- in Armenian). A detailed investigation of the correspondences of Lifu /*d* *g*/ to the consonants of related Eastern Austronesian languages would be interesting: Fijian lacks /*p*/ in native words (it is found only in loans, like Lifu /*b*/), while it has /*t* *k*/ and the full voiced series /*b* *d* *g*/; but the other Polynesian languages have only a voiceless series (except for Tongan, whose voiced series has been explained as due to Fijian influence): see Dempwolff 1920, Dyen 1965.

The mixed character of Lifu was pointed out by Gabelentz 1891:273, who established its relationship to Melanesian (Gabelentz 1873); it has also sometimes provided grounds for regarding Lifu as more closely related to the Papuan languages (Müller 1882:69*n*); for examples

Analogous dominance relations can be found among voiceless stop series. The most marked of the voiceless stops are the glottalized series,⁹ the next most marked are the aspirates, and the plain voiceless stops are the least marked. The hierarchy for increasing markedness is: plain voiceless – voiceless aspirated – voiceless glottalized (Greenberg 1966).¹⁰ Consequently, the most marked consonant among such series is the glottalized labial *p'*, as is shown by the great rarity or complete absence of this phoneme in many languages having glottalized series (Greenberg 1970, Hamp 1970a), e.g. a number of North Caucasian languages, and many African and Amerindian languages, which lack /*p'*/ entirely.¹¹ Thus we have systems of types B', C', and A', while types D and D'¹² are extremely rare exceptions (Gamkrelidze 1974:14-15):

(A')			(B')			(C')		
<i>ph</i>	<i>th</i>	<i>kh</i>	—	<i>th</i>	<i>kh</i>	—	<i>th</i>	<i>kh</i>
—	<i>t'</i>	<i>k'</i>	—	<i>t'</i>	<i>k'</i>	—	<i>t'</i>	<i>k'</i>
<i>b</i>	<i>d</i>	<i>g</i>	<i>b</i>	<i>d</i>	<i>g</i>	<i>p</i>	<i>t</i>	<i>k</i>

(D)			(D')		
—	<i>th</i>	<i>kh</i>	—	<i>th</i>	<i>kh</i>
<i>p'</i>	<i>t'</i>	<i>k'</i>	<i>p'</i>	<i>t'</i>	<i>k'</i>
<i>b</i>	<i>d</i>	<i>g</i>	<i>p</i>	<i>t</i>	<i>k</i>

of Lifu words which do not show the regular correspondences see Kahlo 1960:28-29.

It is important that as his illustration of a phonological gap Martinet uses a highly uncharacteristic example, that of Lifu, for which there is no stage at which the absence of *b* can be reconstructed. Yet precisely this example subsequently appears in textbooks as a typical illustration of a gap in a phonological system.

9. We use the term *glottalized* in the strict sense, equivalent to *ejective* (see Ladefoged 1971:16ff.).

10. Objections can be made to the claim of Swiggers 1980 that in the South Arabian language Harsusi glottalized *t*, *ʃ*, *ʒ*, and *q* (and also preglottalized *q̣*) are more frequent than voiceless aspirates. For one thing, it is methodologically incorrect to oppose the entire glottalized series, which includes fricatives, to voiceless aspirate stops. Aspiration is not phonologically relevant in the voiceless aspirate stops, hence there is an opposition of glottalization within the voiceless stops. But in such an opposition, the defective glottal series _ *t' q'* (with missing labial member) cannot possibly be more frequent than the unglottalized series *p t k* (although the individual glottalized member *q'* may be more frequent than unglottalized *k*: see Melikišvili 1974:101ff.).

11. Greenberg's universals concerning the distribution of glottalized consonants in systems have been largely confirmed by the extensive survey of Fordyce 1980.

12. A system of this type, with a gap for the aspirated labial (instead of the glottalized labial, which we could expect to find lacking), is found in one dialect of Galla (Andrzejewski 1957, Sasse 1973).

The next inconsistency between the traditional Indo-European stop system and synchronic typological data is the absence of a voiceless aspirated series despite the presence of a voiced aspirated series (noted by Jakobson 1957a). There are no languages attested with a voiced aspirate series but no voiceless aspirates.¹³ In this respect the traditional reconstructed system is in clear contradiction with the facts of synchronic typology.¹⁴

1.2.2. A reinterpretation of the Indo-European stop system. Glottalization as a natural feature for the defective stop series

The respects in which the traditionally reconstructed Indo-European stop system fails to conform to synchronic typological facts demand reconsideration of the system so as to bring it into alignment with what is known about typology. Any reinterpretation of the Indo-European stop system must be done with an eye to the diachronic deducibility of the system, which must make possible non-contradictory, typologically verifiable derivation of all attested daughter systems from the posited protosystem. It is of particular importance to define the distinctive features of the three Indo-European stop series in a way that will cor-

13. Jakobson's proposed universal has recently been disputed by Blust (1973) on the evidence of the Austronesian language Kelabit. This language has three clear stop series, which Blust interprets as voiced /b d g/, voiceless /p t k/, and voiced aspirated /b^h d^h g^h/. Unfortunately, the paper does not give a precise phonetic description of the sounds to support this phonemic analysis. But even the examples cited give reason to interpret the series not as voiced, voiceless, and aspirated, but rather as voiced /b d g/ (with combinatory variants [b], [d], [g] and [-bb-], [-dd-], [-gg-], the latter set after stressed *ə́*), voiceless /p t k/ (with combinatory variants [p], [t], [k] and [-pp-], [-tt-], [-kk-], the latter set after stressed *ə́*), and half-voiced /b d g/ (with combinatory variants [b], [d], [g] and [-bp-], [-dt-], [-gk-], the latter set after a stressed vowel). Blust himself notes that 'aspiration' (more precisely, the voiceless onset of the following vowel) is optional in the geminated variants of these phonemes. Here we evidently have to do not with phonological aspiration of a voiced stop series, but with phonological half-voicing and hence greater intensity compared to the plain voiced series. This is shown by the appearance of sequences -bp^hl-, -d^hhl-, -gk^hl- after a stressed vowel, i.e. a sequence of lax voiced consonant followed by tense voiceless, e.g. in alternants such as *təp^hlən* 'chopping down of trees' beside *təbáŋŋən* 'chop down (imper.)'.

This interpretation of the Kelabit consonants as half-voiced finds a close structural parallel in northern Chinese dialects which have half-voiced /b d g/, each with two variants: [b d g] and [-pb-], [-td-], [-kg-] (Polivanov 1928, 1968:68, 250-51). These differ from the Kelabit series only in the distribution of allophones and the order of segments in the second allophone type. In Chinese, the voiced variant appears in intervocalic position and the half-voiced one initially. The absence of aspiration in the half-voiced allophone of Chinese is due to the order of its segments, with the voiceless one preceding the voiced, whereas in Kelabit we have the opposite order, voiced plus voiceless, which naturally allows for aspiration in the form of a voiceless onset of the following vowel.

14. On this basis, Szemerényi (1967:94ff., 1970, 1972:134) attempts to reconstruct a fourth series of voiceless aspirated consonants, thereby returning to the system posited earlier by Brugmann (see also Back 1979). This is unjustified from the standpoint of comparative analysis, since the voiceless aspirates of Indo-Iranian and other branches give clear evidence of combinatory origin.

respond to the facts of both synchronic and diachronic typology.¹⁵

We begin with a detailed survey of each series of the traditional system (System I) in relation to the others. The violation of typological facts noted by Jakobson, namely the lack of voiceless aspirates beside the voiced aspirates of the traditional system, disappears if we reinterpret Series III ('voiceless') as voiceless aspirated. Such an interpretation is consistent with the reflexes of this series in a number of historical Indo-European languages. Thus we have voiceless aspirates (Series III) beside the voiced aspirates of Series II, which brings the traditional system into full accord with synchronic typological facts and provides for natural derivation of the attested systems from it.

The reinterpretation of Series III as voiceless aspirated brings us to the question of how that series was related to the other two, especially Series I. The reinterpretation of Series III is sufficient to require a new interpretation of Series I. Moreover, the internal properties of Series I themselves demand reinterpretation and accommodation to typological facts. Series I, traditionally reconstructed as voiced, must be reinterpreted as nonvoiced in view of its missing labial member: as was shown above, cross-linguistically the labial member is often defective (missing or of low textual and systemic frequency) and hence marked in voiceless stop series. Furthermore, the most marked of these series, as has been shown by Greenberg 1970, is the glottalized series, for which the absence or low frequency of *p'* is typical. This universally valid feature of ejectives bears directly on the phonological status of Series I with its defective labial member. It is also relevant that Series I shows a lower overall frequency than Series II and an even more disproportionately low frequency in comparison to Series III. According to counts by Jucquois (1966), the overall frequencies of phonemes of the three series in root morphemes are as follows:

Series I	6.2%
Series II	8.9%
Series III	17.7%

This is consistent with the absolute frequencies of occurrence of phonemes from the three series in Indo-European words, based on our counts of Pokomy.

These frequency correlations in themselves are sufficient to raise doubts about the traditional interpretation of the three series as respectively voiced, voiced aspirated, and voiceless. The voiced aspirated series, typologically

15. The discussion to follow deals only with the three points of articulation that are certain: labial, dental, and velar. As has been noted above, the full membership of the dorsal set, in Indo-European or in groups of dialects, has no bearing on this problem and will be given separate attention later when the full stop system of Indo-European is discussed. It should be borne in mind that our conclusions about the manners of articulation within the velar set are also valid for the other dorsals grouped with the velars. Thus in our notation we use the cover symbols *G*, *G^h*, *K* for the velars together with the other dorsal phonemes.

marked in comparison to the plain voiced series, should not be the more frequent of the two according to the universal frequency relations of markedness. If Series I is interpreted as glottalized, the frequency properties of the three series are in full accord with typologically established frequency correlations of ejectives in relation to other voiceless series, in particular voiceless aspirates and plain voiceless consonants.

In interpreting Series III as voiceless aspirated, in accord with typological considerations and the reflexes in the daughter languages, we are forced to interpret Series I, with its defective labial, as glottalized and not, for instance, as plain voiceless or voiceless aspirated. The two latter interpretations are excluded in any case by the fact that within unvoiced stops a glottalized series is the most marked in comparison to aspirated and plain voiceless stops. The aspirated series is in turn more marked than the plain voiceless series. Thus if one labial member is missing among unvoiced stops, the gap must necessarily be in the most marked glottalized series, not in the less marked aspirates or the even less marked plain voiceless stops (cf. 1.2.1 above).

In summary, when Series III is reinterpreted as voiceless aspirate and frequency correlations are considered, the defective labial phoneme of Series I forces us to interpret Series I as a glottalized series. On this interpretation, the Indo-European stop system takes the following form:

Table 3

I	II	III
(p')	b ^h	p ^h
t'	d ^h	t ^h
K'	G ^h	K ^h

Defining Series II in this system as voiced aspirates brings us to the question of the phonetic reality of its consonants. Based on typological comparison with the modern Indo-Aryan languages (Catford 1964, 1977:106, Ladefoged 1967:9), the traditional voiced aspirates of Indo-European are generally seen as the type of stop characterized by murmured release, pronounced with breathy voice (Ladefoged 1971:12, Lass 1974, Hopper 1973, Butler 1974).

An essential phonological fact is that, in systems having phonemes with murmured release, this series is opposed to a voiceless aspirate series. Thus they can be defined phonologically as voiced (or non-voiceless) aspirates, phonetically realized as voiced or half-voiced (e.g., the Georgian voiced stops)

with accompanying aspiration. The aspiration may also be voiced, involving vibration of the vocal cords (or part of them, with the other part open). Such sounds are characterized by intensity of articulation. An example is the voiced aspirates of several contemporary Armenian dialects.¹⁶

The stop system we have posited for Indo-European is in complete accord with the synchronic typological facts: the defective glottalized labial, functionally the weakest member of the group of unvoiced consonants; the presence of voiceless aspirates as well as voiced aspirates; the relative frequencies of the various series, reflecting increasing markedness as we go from voiceless aspirates to voiced aspirates to glottalized consonants.¹⁷

1.2.3. A phonological characterization of the reconstructed Indo-European stop series

In the stop system we posit for Indo-European, aspiration is phonologically irrelevant, since series II and III are opposed not in aspiration but in voicing. Aspiration must be regarded as an incidental phonetic feature accompanying the phonemes of these series. In strictly phonemic terms Series I can be described as glottalized, II as voiced, and III as voiceless. However, phonetic aspiration is a very important feature of Series II and III, one which explains their subsequent development and eventual reflexes in the daughter languages. Such phonetic features play a major role in diachronic phonemic transformations, and it is essential that they be considered together with phonological features in the reconstruction of phonological systems.

Since aspiration is irrelevant to the phonemes of Series II and III, they can have allophonic realizations without aspiration. Aspirated and unaspirated phones both could appear as combinatory variants of Series II and III phonemes. Every Series II and III phoneme must have had both aspirated and unaspirated allophones depending on position in the word.¹⁸ Table 4 shows the phonetic variants to be reconstructed for the phonemes shown above in Table 3.

16. For Armenian see Allen 1951; for aspirates in Gujarati see Fischer-Jørgensen 1968:88-89, Elizarenkova 1974:180-81; also Ternes 1973:20.

17. We proposed this stop system for Proto-Indo-European in 1972 (Gamkrelidze and Ivanov 1972, 1973; see also Gamkrelidze 1976, 1977). A similar system of Indo-European stops is reconstructed by Hopper (1973, 1977). The possibility of interpreting the defective stop series as glottalized had been noted in passing by Martinet in a work dealing with Semitic consonants (1953b:70). Glottalized stops are also posited by Širokov 1972, in Indo-European reconstructions which are not entirely clear from a typological point of view.

This conception of the Indo-European consonantism has begun to be called the 'glottalic theory' in Western works: Bomhard 1979. A similar view of the Indo-European voiced series has recently been advanced by Haudricourt 1975, although without reference to the preceding works.

18. Gamkrelidze 1976, 1977; see also Normier 1977.

Table 4

I	II	III
<i>(p')</i>	<i>bh/b</i>	<i>ph/p</i>
<i>t'</i>	<i>dh/d</i>	<i>th/t</i>
<i>K'</i>	<i>Gh/G</i>	<i>Kh/K</i>

This reconstructed Indo-European stop system is typologically plausible as regards the relations among the individual series and can be regarded as typologically realistic overall. Phonemic inventories of this type, where stops contrast in glottalization and voicing, are extremely frequent among the world's languages. An example where voiced aspirated and plain voiced sounds are allophones of one phoneme type comes from modern Armenian dialects, where aspirated and unaspirated voiced sounds are positional variants (see Allen 1951, Djahukian 1967b:78-81). The existence of such systems provides good typological confirmation for our reconstruction of the Indo-European stop system.

Table 5

Phonetic and phonological feature matrix for the Proto-Indo-European stops. (The matrix includes both phonological features and those phonetic features that were essential to the functioning and development of the Proto-Indo-European system; the symbols chosen are maintained throughout the book with optionality of aspiration left unexpressed in stops of the series II and III.)

	<i>(p')</i>	<i>t'</i>	<i>K'</i>	<i>bh</i>	<i>dh</i>	<i>Gh</i>	<i>ph</i>	<i>th</i>	<i>Kh</i>
Syllabicity	—	—	—	—	—	—	—	—	—
Stopness	+	+	+	+	+	+	+	+	+
Voicing	(—)	(—)	(—)	+	+	+	—	—	—
Glottalization	+	+	+	(—)	(—)	(—)	—	—	—
Labialization	+	(—)	(—)	+	(—)	(—)	+	(—)	(—)
Dentality	(—)	+	(—)	(—)	+	(—)	(—)	+	(—)
Velarity	(—)	(—)	+	(—)	(—)	+	(—)	(—)	+
Aspiration	(—)	(—)	(—)	±	±	±	±	±	±

1.3. Phonotactics and combinatory rules for the Indo-European phoneme series

1.3.1. The basic canonical forms of the Indo-European root

The allophones of the stops must have been positionally conditioned when phonemes were combined in the Indo-European word. The conditioning environment could have been either the adjacent phoneme or a more distant one, separated from the stop by an intervening vowel and possibly other phonemes in the same word. In forms with zero grade an otherwise distant conditioning phoneme could become adjacent.

The basic phonotactic rules for stop distribution within the word can be formulated as constraints and restrictions on the combinability of phonemes or individual features. A fundamental restriction imposed on the entire stop subsystem was a constraint against combining identical phonemes within the root. It can be formulated as Rule 1:

Rule 1. No two stop phonemes with identical feature values can cooccur in a root of the structure C_1VC_2 -. (Roots of the shape T_1ET_2 , where $T_1 = T_2$, are impossible.)^{19, 20}

A fundamental constraint on phoneme combinability within the root was a prohibition on distant combination of two phonemes of Series I,²¹ i.e. two glottalized consonants. Thus:

Rule 2. No two glottalized consonants (i.e. consonants of Series I) can cooccur in the same C_1VC_2 - root. (Roots of the shape $*t'ek$ -, i.e. traditional $*deg$ -, are impossible.)

This constraint against the occurrence of two glottalized consonants in the

19. Here and below, T stands for any stop, T^h for any voiceless (aspirated) stop, T' for any glottalized stop, and D^h for any voiced (aspirated) stop, with each symbol representing an entire series. Thus a form T^hET' or T'ET^h- subsumes any combination of phonemes of the two series involved, except for identical phonemes, which are precluded by Rule 1.

20. There is reason to assume that Rule 1, prohibiting combinations of identical phonemes (see also Benveniste 1935:170-71, 1955:201-2), is an instance of a more general rule, Rule 1', which precludes combinations of two phonemes of the same point of articulation within a root of the structure CVC-. Evidently a principle of heterorganic phoneme combinations operated in the Indo-European root. This problem will be investigated in more detail when the Indo-European points of stop articulation are examined. At this point, what is of interest is the nature of the Indo-European manners of stop articulation, the series, and the relations among the series.

21. This principle was already clearly stated (in terms of the traditional voiced series) by Meillet 1937, 1938:191; see also Lehmann 1952, Ammer 1952, Szemerényi 1970, Jucquois 1966.

same morpheme finds wide typological parallels in languages having glottalized consonants. For instance, in native Kartvelian words no two non-identical glottalized consonants may cooccur. An analogous restriction is found in Shuswap, a Salishan language of British Columbia, where in roots of the form C_1VC_2 - (also C_1RVC_2 -, C_1VRC_2 -) C_1 cannot be glottalized if C_2 is (Kuipers 1974:23). Similar constraints are observed in a number of other Amerindian languages, e.g. Yucatec (Mayan: Straight 1972:59) and Quechua (Carenko 1972:100, 1973:82, 1974a:19, 1974b:95, Rowe 1950:139-40, Orr and Longacre 1968:529-30), as well as in Hausa (Chadic), where two heterorganic glottalized consonants are never found within one word (Parsons 1970:280).²²

Such constraints point to physiological and articulatory properties of the glottalized consonants, which tend not to cooccur in distant combinations. In general these constraints do not hold if the two consonants are homorganic; however, for Indo-European, homorganic distant combinations are precluded by Rule 1. Glottalization, like pharyngealization, aspiration, and several other features, can be described phonetically as a *dissimilating* feature, one which tends not to occur twice in a syntagmatic sequence (voicing, in contrast, is a non-dissimilating feature). This accounts for the cross-linguistic low frequency of words with two ejectives or two pharyngealized consonants, as well as for the tendency to avoid creating such sequences in inflected forms (see Ohala 1981:193-95).

Rule 2 is essential to the typological justification of Series I as glottalized (rather than, as traditionally, voiced). When Series I is interpreted as voiced, it is difficult to find typological parallels for a constraint against cooccurrence of voiced consonants in the root or for the impossibility of roots such as **ged*- and **deg*-. This constraint, noticed by Meillet (1937, 1938; see also Lehmann 1952, Jucquois 1966, 1971), has so far gone unexplained. When we reinterpret the traditional voiced stops as glottalized, the difficulty is removed and the Indo-European constraint can be reduced to a general typological regularity governing phonotactics.²³

The combinability of glottalized consonants with those of Series III is unconstrained, and all theoretically possible combinations can occur. Thus:

22. The same constraint against combining two glottalized consonants (including glottal stop) also explains the origin of a tone in Lahu (of the Loloish subgroup of the Lolo-Burmese branch of Sino-Tibetan): Matisoff 1970. There is a phonetic constraint against two pharyngealized (emphatic) consonants occurring in the same root in Akkadian: in the Akkadian root, one of two Semitic heterorganic emphatic consonants undergoes dissimilation and appears as a simple (unmarked) consonant (Geers's Law): see Geers 1945.

23. Glottalization of the Indo-European Series I also explains the fact (long noted) that the traditional 'voiced' consonants are almost never found in affixes, unlike the consonants of Series II and III. This would be difficult to explain on typological grounds if Series I were treated as voiced. Glottalized stops, on the other hand, are typologically characterized by restrictions on their distribution among morphological elements: Hopper 1973:157.

Rule 3. Glottalized consonants can cooccur with any member of Series III in any order. (The combinations T'ET^h and ThET' are possible.)

There is a striking absence of Indo-European roots combining consonants of Series II and III (in either order). There are no roots of the shape DhET^h, ThED^h (in traditional terms, **bhet-* and **tebh-*). Thus:

Rule 4. Non-glottalized consonants within the root must have identical values for the feature of voicing. (Only roots of the shape DhED^h and ThET^h are possible.)²⁴

The absence of Indo-European roots of the type DhET^h and ThED^h could be explained diachronically, as the result of distant voicing assimilation: the earlier ThED^h and DhET^h would have yielded ThET^h or DhED^h, still within Proto-Indo-European. Thus the roots with homogeneous voicing may conceal some earlier roots with discrepant voicing (see Miller 1977a:32). This could explain the fact that the root types ThET^h and DhED^h are more frequent than the other admissible types: they include the reflexes of roots with heterogeneous voicing as well as those with originally homogeneous voicing.

These combinatory possibilities for stops in the Indo-European root can be reformulated in terms of distinctive features. For example, the constraint against sequences T'ET' can be stated as a constraint against combining two feature matrices with positive values for glottalization. The non-occurrence of the shapes DhET^h and ThED^h reflects the impossibility of combining two feature matrices with different values for voicing; the only distant combinations allowed have identical values for this feature.

The combinatory possibilities for individual phonemes in the Indo-European root can be surveyed after the full inventory of point-of-articulation types is given and the restrictions on their combinability are established (i.e. the intersections of the series and the local rows; see above and note 20 for Rules 1 and 1'). At this preliminary stage we have been working with the minimum number of local rows accepted by most investigators, which is sufficient for non-contradictory decisions about the nature of the series and the definition of their distinctive features. The information introduced so far concerning the number of rows and their nature is necessary and sufficient for judging the phonological nature of the Indo-European stop series.

24. This rule was first noted by Saussure (see Meillet 1912:60, Benveniste 1935:171n1, Szemerényi 1972:143n51). Based on this rule, Kuryłowicz (1973b:68, sec. 1.5, note 6) suggests that the phonemes of Series II and III were opposed not by two distinctive features (aspiration and voicing) but by 'one phonemic feature', a view which is close to ours. However, Kuryłowicz considers Series II to be neutral in voicing.

1.4. The distribution of allophones of the voiced and voiceless series

1.4.1. *The distribution of aspirated allophones and their reflexes in Sanskrit and Greek. Grassmann's Law as the Indo-European rule determining allophones for Series II*

A characteristic property of the Series II (voiced) and III (voiceless) stops is their phonetic feature of aspiration. Each phoneme of these series had two allophones, aspirated and unaspirated, depending on the phonetic environment.

The linguistic facts tell us with a fair degree of precision in what positions the phonemes of Series II and III appeared in their aspirated and unaspirated forms. The aspirated variant is the basic allophone, since it appears in most of the phonetically independent positions which can be established for Proto-Indo-European on comparative grounds. The unaspirated variant appears in particular phonemic contexts. Consequently the task of distributive analysis is to determine the positions in which the phonemes appeared in their unaspirated forms. The second, voiced series lends itself most precisely to this kind of analysis. In the daughter languages it has left quite clear traces which make it possible to reconstruct its distribution in Indo-European wordforms.

One of the major principles determining the behavior of Series II is the fact that when two Series II phonemes appear in a single stem they must always appear as different allophones — one aspirated, the other unaspirated. This is formulated in Rule 5:

Rule 5. In a stem with two Series II stops in distant combination, one of them is always aspirated and the other unaspirated.²⁵

Thus any stem can contain only one unaspirated sound. If the initial consonant is unaspirated, the second is aspirated, and vice versa.

This distributional property of Series II consonants can be clearly seen and reconstructed on the basis of Indo-Iranian and Greek evidence. These languages reflect an allophonic rule for Series II whereby the unaspirated allophone is found initially and the aspirated one non-initially before a vowel or sonant:²⁶

25. A typological parallel is the connection in Quechua between a rule against combinations of aspirated stops and one against combinations of glottalized stops (Carenko 1972:102).

26. The unaspirated *d* in Skt. *dvār-* 'door' beside Gk. *thúra*, Lat. *forēs* 'double door' (PIE **dhwer-* / **dhur-*) is evidently due to a secondary, Indic loss of aspiration. In Sanskrit, initial *dh* is an unstable sound which tends to lose one of its features (usually stopness): cf. *hitá-* 'supplied; good' < **dhitá-*, *grhá-* < **grdhá-* 'house', etc. (Wackernagel 1896:I, sec. 217ff.; Bloch 1934:64ff.). Independently of this tendency, loss of aspiration in the initial **dh* of 'door' could have been facilitated by identification of this word with 'two, double', *dváu* (Pokorny 1959:279), cf. the meaning 'double door' of Lat. *forēs*.

Skt. *bāhúḥ* ‘arm’, Gk. *pēkhus* ‘elbow’ point to PIE [***baGhu-s**], with an initial unaspirated allophone and a non-initial aspirated allophone of PIE ***bh** and ***Gh** (both underwent devoicing in Greek).

Skt. *badhnāti*, later *bandhati* ‘ties, binds’, *bándhuḥ* ‘kinship, kinship by marriage, relative’, Gk. *pentherós* ‘father-in-law, wife’s father’ (from ‘related by marriage’): PIE [***bendh-**].

Skt. *bahú-* ‘dense, thick, numerous’, Gk. *pakhús* ‘fat, thick’: PIE [***benGh-**].

Skt. *bódhati*, *bódhate* ‘wakes up, wakens’, Gk. *peúthomai*, *punthánomai* ‘(I) recognize, notice, stay awake’: PIE [***beudh-**], [***budh-**].

Skt. *budhnāḥ* ‘soil’, Gk. *puthmén* ‘soil’: PIE [***budh-**].

Skt. *dáhati* ‘burns’, *nidāgá-ḥ* ‘heat, summer’, Gk. *téphra* ‘ashes’: PIE [***deGh-**].

Skt. *deh-* ‘rub, smear, spread on, anoint’, *dehí* ‘wall, dam, embankment’, Gk. *teîkhos* ‘wall’: PIE [***deiGh-**].

These Sanskrit and Greek cognates provide good evidence for the distribution of aspirated and unaspirated allophones in Indo-European.

We find analogous distributional behavior of Series II phonemes in forms with reduplication of the initial consonant. Reduplicated forms of the Indo-European verb roots ***dhē-** ‘put, place’, ***Ghē-** ‘leave’, ***bher-** ‘carry’, and others yield particularly good evidence. Reduplicated forms are represented by Skt. *dádhā-mi*, Gk. *títhē-mi* ‘(I) put’ from PIE [***di-dhē-mi**]; Skt. *jáhā-ti* ‘leaves’, Gk. **kíkhēmi* ‘(I) overtake’, 2sg. *kíkheis*, from PIE [***gi-Ghē-thi**]; Skt. *bí-bhar-ti* ‘carries’ from PIE [***bi-bher-thi**], cf. Gk. *es-piphránai* ‘carry in’ (Mayrhofer 1963:II.475).

The closeness, even identity, of the Sanskrit and Greek verb forms with initial reduplication, together with current assumptions about the unity of the Greek-Aryan verb system, permit us to see the pattern as an areal one within Indo-European, which also confirms the Indo-European source of these phoneme alternations. They cannot be explained as due to deaspiration and independent parallel development of unaspirated phonemes in the two branches (the usual understanding of Grassmann’s Law in classical Indo-European linguistics: Grassmann 1863, 1863a), but must be seen as the reflex of a shared distributional rule that had areal status in Proto-Indo-European. The facts from the other Indo-European languages — Italic, Germanic, and others — are fully consistent with this treatment of these correspondences.

Thus Grassmann’s ‘Law of Deaspiration’ acquires a completely new interpretation. It can be seen as the alternation of aspirated and unaspirated sounds at the allophonic level in Proto-Indo-European, not as independent deaspiration of aspirated phonemes in Sanskrit and Greek. The virtual identity of the Sanskrit and Greek deaspiration is due to their common origin in Indo-European.²⁷ It

27. For Grassmann’s Law as Proto-Indo-European in nature cf. also Butler 1974:19.

follows that this process is to be reconstructed for Indo-European as an allophonic rule, which later turned into a phonemic alternation when the reflexes of the aspirated and unaspirated voiced allophones were phonologized in the daughter branches. After the reflexes of Series II and III were phonologized in Sanskrit and Greek, the former allophonic rule turned into a rule for alternation of aspirated and unaspirated phonemes within the stem. This explains the productive Greek morphophonological alternation of *trikhós* ~ *thríks* 'hair' (PIE [***drigh-**]), *takhús* ~ *thássōn* 'fast' (PIE [***dngh-**]),²⁸ and formations such as Skt. *vidátham* 'distribution' (from **vidh-atha-*, with positional deaspiration of *dh* to *d*: see Mayrhofer 1976:III.208).²⁹

Thus the Indo-European protoforms for the words discussed above are to be reconstructed not as ***bhāGh-**, ***bhenGh-**, ***bheudh-**, ***bhudh-**, ***dheGh-**, ***dheiGh-**, etc., with subsequent independent deaspiration of the reflexes of the initial ***bh** and ***dh** in Indic and Greek, but rather as [***bāGh-**], [***benGh-**], [***beudh-**], [***budh-**], [***deGh-**], [***deiGh-**], etc., with positionally opposed aspirated and unaspirated allophones of Series II voiced phonemes. These forms are reflected regularly in Sanskrit as *bāh-*, *bah-*, *bodh-*, *budh-*, *dah-*, *deh-*, and in Greek as *pākh-*, *pakh-*, *peuth-*, *puth-*, *teph-*, *teikh-*, etc. (with the regular Greek devoicing of both allophones, aspirated and unaspirated, of Series II). Thus the process of 'deaspiration' by Grassmann's Law acquires a common explanation in Sanskrit and Greek.

In addition, Sanskrit also preserves traces of different reflexes of these same roots in a different phonemic context: before pause (i.e. in absolute final position), and before *-s-* and certain other obstruents (those of Series II but not those of Series III): see below on Bartholomae's Law. Here the roots appear in forms such as [***bhud-**]: nom. sg. *bhut*, suffixed form *bhotsyati*, instr. sg. *bhudbhis* (Whitney 1889: §§ 141, 153-55, Anderson 1970, Phelps and Brame

28. Therefore there is no justification for dating Grassmann's Law to the sixteenth to fifteenth centuries B.C., the time when palatalization was operating in Greek, on the basis of Greek alternations like *takhús* : *thássōn* (see Janko 1977).

Sporadic Greek forms with two aspirates, such as *thuphlós* beside the regular *tuphlós* 'blind', should be regarded not as counterevidence to the ancient allophonic principle for two aspirates (contrary to Thumb and Scherer 1959:266; see also Miller 1977b), but rather as reflecting the rule assigning aspiration to one of two stops in a sequence and a subsequent generalization of aspiration over all segments of the sequence (see Hoenigswald 1965a). Another relevant factor is the later aspiration assimilation of stops (/C...Ch/ > /Ch...Ch/ or /Ch...C/ > /Ch...Ch/), which yields forms with two aspirates as found in Old Attic and Old Cretan: *Théthís* instead of *Thétis*, *Phánphaios* instead of *Pámphaios*; cf. also forms such as *thuthén* 'sacrificial' from *tuthén* (see Dressler 1975:65).

29. On the other hand, there is insufficient justification for deriving Skt. *kumbhá-* 'pot, mug', Avest. *xumbō* 'pot' from Indo-Iranian **khumba-* (with two aspirates), since the correspondence of Skt. *k* to Iranian *x* is regular (Mayrhofer 1956:I.234). The source is rather to be reconstructed as [**kumbha-*], with one aspirate in non-initial position, following the allophonic law of Indo-Iranian. The correspondence of Skt. *k* to Iranian *x* could have arisen as the result of later spirantization of the initial stop in Iranian, as is particularly characteristic of consonant clusters.

1973). These forms observe a rule which, as formulated by Whitney (1889: §155a), “forbids a root to both begin and end with an aspirate.”³⁰

1.4.2. Reflexes showing the distribution of aspirated allophones in Italic

The general law for the distribution of aspirated and unaspirated allophones in the Indo-European root (Rule 5) is not realized uniformly in all dialect areas. Sanskrit and Greek show the distribution [DED^h], i.e. unaspirated-aspirated. Some Indo-European daughter dialects — Italic and possibly Germanic — show the opposite order: [D^hED], i.e. aspirated-unaspirated.³¹ This distribution can explain the fact that the Italic, particularly Latin, forms have initial *f* and *h* where their Greek and Aryan cognates show reflexes of initial unaspirated allophones. The same forms in Italic, particularly Latin, have voiced *b*, *d*, and also *w* in non-initial position, and these can be interpreted as reflexes of the Indo-European unaspirated allophones of the voiced Series II. The forms in question include:

Lat. *fīdō* ‘(I) believe’, *foedus* ‘union’ (PIE [*b^he/oid-]) : Gk. *peíthomai* ‘(I) become convinced’ (PIE [*beid^h-]).

Lat. *offendix* ‘chin strap of priest’s hat’ (ritual term) (PIE [*b^hend-]) : Skt. *badhnāti* ‘binds, ties’, Gk. *peísma* ‘rope’, *pentherós* ‘son-in-law, brother-in-law’, Skt. *bándhuh* (PIE [*bend^h-]).

Lat. *fiber* ‘beaver’, reduplicated form [*b^hi-ber] of the root [*b^her-] : Skt. *babhrúh* ‘reddish-brown’ ([*be-b^her], with another type of reduplication; see below for the vowels associated with reduplicated consonants).

Lat. *fīdēlia* ‘clay pot’ (PIE [*b^hid-]) beside Gk. *píthos* ‘clay vessel’ (PIE [*bid^h-]).

Lat. *foueō* ‘(I) warm up, become concerned’ (PIE [*d^heG-]) beside Skt. *dāhati* ‘burns’ (PIE [*deG^h-]): cf. 1.4.1 above.

Lat. *fingō* ‘(I) shape, mold, give form’, *figūra* ‘shape, figure’ (PIE

30. Cf. Elizarenkova 1974:47. Allen 1957 investigates similar rules which make aspiration a ‘prosodic’ feature distributed over the whole word, based on modern Indo-Aryan (Rajasthani) data.

31. This latter distribution must be posited in special cases for Indo-Aryan as well, in the particular syntagmatic positions enumerated above. These facts make it possible to formulate a single shared Proto-Indo-European constraint allowing only one aspirated allophone in roots with Series II consonants. Whether that aspirated allophone was the initial or the non-initial one was determined by syntagmatic factors as it combined with other elements.

Certain facts in the aspiration alternation within one and the same root in Sanskrit and Greek can be regarded as traces of the Proto-Indo-European alternation of allophones of Series II stops. Then the consistent treatment of reflexes of Series II in Indo-Aryan and Greek, which both show an unaspirated initial and a non-initial aspirate, can be seen as due to generalization of one of the alternating root forms to the entire paradigm.

[*dhi(-n-)G-]) beside Skt. *dehī*, Gk. *teikhos* 'wall' (PIE [*deiGh-]).

Lat. *habēō* '(I) hold, have, own' (PIE [*Ghab-]) beside Skt. *gābhastih* 'hand' (PIE [*Gabh-]).

The aspirated + unaspirated order of Italic, as opposed to unaspirated + aspirated of Aryan and Greek, is especially clear in Lat. *hordeum* 'barley' (dial. *fordeum*) from PIE [ǵhṛd-];³² cf. Hom. Gk. *krī*, *krithē* (pl. *krithai*) 'barley', which points to [*ǵrīdh-] (unaspirated + aspirated). If an Italic protoform with two aspirates were posited, i.e. [*ǵhṛdh-], then we would expect different reflexes in Latin, since *-rdh- would regularly give -rb-, hence **horbeum*. The Latin form could be explained in traditional terms only by positing two phonetic variants of the protoform, one with a final aspirate *dh to account for the Greek form and one with a plain voiced *d for the Latin form (see Pokorny 1959:446). Below, as part of our account of the transformation of the Indo-European stop system in Italic, we survey concrete Italic data that can be interpreted as confirming the aspirated-unaspirated ordering of allophones. The phonological transformations differ from those proposed in traditional descriptions of Italic prehistory.

In reduplicated verbal forms such as Osc. *fefacit* 'fecerit; he would make/do', the reflexes of aspirated and unaspirated allophones would appear at first glance to contradict the aspirated-unaspirated order we have proposed for Italic. However, these forms actually show a specifically Italic morphological principle whereby the reduplicated consonant was identical with the root-initial consonant: cf. Lat. *bibō* '(I) drink' beside Skt. *pībati* (Mayrhofer 1963:II.286-87); OLat. *cecurrī* beside later *cucurrī* '(I) ran', etc.

Thus we can reconstruct an Indo-European model for the distribution of Series II voiced phonemes over their aspirated and unaspirated allophones, depending on the position in the word. Doublets can be reconstructed which show allophonic alternations of the form [DEDh]/[DhED]; the first form underlies the reflexes from the Greek-Aryan area, the second those of Italic and other western dialects (e.g. Germanic).³³ The principle of deaspiration classically known as Grassmann's Law reduces to an Indo-European combinatory regularity governing the allophony of Series II phonemes in nominal and verbal stems. This interpretation makes it possible in principle to give a uniform Proto-Indo-European explanation for phonological regularities formerly regarded as disconnected phenomena pertaining to individual daughter branches.

32. The dialect form *fordeum* can be derived from *dhṛd- < *ǵhṛd- by dental assimilation.

33. Under various syntagmatic conditions surveyed above, the order DhED could also occur in Indo-Aryan, which shows that the conditioning of allophones was originally syntagmatic and the allophones were subsequently fixed in the separate dialect areas.

1.4.3. The distribution of aspirated allophones of the Indo-European voiceless phonemes in immediate and distant combinations

The reflexes of the phonemes posited for the Indo-European voiced and voiceless series make it possible in some cases to establish models for their distribution and allophony in immediate combinations with contiguous phonemes. This is particularly clear in the analysis of Germanic forms reflecting clusters of Series III phonemes such as [***pt**], [***kt**] and sequences of /***s-**/ and Series III phonemes.³⁴

Like the voiced phonemes of Series II, the voiceless phonemes of Series III usually appeared in the form of their aspirated allophones; that is, the neutral, combinatorily unconditioned allophone was the aspirated one. However, there were certain positions which required unaspirated allophones, and these allophones are directly reflected in the Germanic languages. The Germanic languages require reconstructions of clusters such as [***ph̥t**], [***k̥ht**], aspirated allophone followed by unaspirated; and [***-sp-**], [***-st-**], [***-sk-**], where an unaspirated allophone followed ***s**:

[***ph̥t**]: OHG *nift-* 'niece' beside Lat. *neptis* 'granddaughter', Skt. *naptī* 'granddaughter'.

[***k̥ht**]: Goth. *ahtau* 'eight' beside Lat. *octō*, Toch. A *okāt*, B *okt*, Gk. *oktō*; Goth. *nahts* 'night' beside Lat. *nox*, gen. *noctis*, Lith. *naktis*, Gk. *núks*, gen. *nuktós* 'night'.

[***sp-**]: OHG *spehōn* 'look out' beside Lat. *speciō* '(I) look'.

[***st-**]: Goth. *stairnō* 'star', OHG *sterno* beside Lat. *stēlla*, Gk. *astēr* 'star'.

[***sk-**]: Goth. *fisks* 'fish' beside Lat. *piscis* 'fish'.

These Germanic forms illustrate very clearly how the Indo-European phonemes of Series III behaved in clusters with other consonants of Series III. The first allophone was aspirated and is regularly reflected as a Germanic fricative (as it is in neutral, unconditioned positions), while the second was unaspirated and is preserved as a plain voiceless stop, as it is in the position after ***s-**.

Interestingly, an analogous reflex of Series III is found in Celtic as well. There the consonants of Series III are normally reflected as aspirated [***ph̥**], [***th̥**], [***k̥h̥**] (with subsequent spirantization and loss of [***ph̥**]), which can be regarded as a direct continuation of the phonetics of the Indo-European allophones of this series. However, in clusters we find the second element unaspirated, a reflex of the same Indo-European allophonic distribution. The Indo-European clusters [***ph̥t**] and [***k̥ht**] appear in Celtic as **ft* > *xt* and *xt* respectively, with lenition of the first, aspirated, consonant and preservation of the

34. The status of the fricative /***s**/ in the Indo-European phonological system will be discussed below, in connection with the stop points of articulation.

second, allophonically unaspirated, as a plain unaspirated stop:

[*p^ht]: OIr. *necht* 'niece' beside Lat. *neptis*, Skt. *naptī*, OHG *nift* (cf. Ger. *Nichte*); OIr. *cacht* 'servant' beside Lat. *captus* 'captive', OHG *haft*; OIr. *secht n-* 'seven' beside Lat. *septem*, Gk. *heptá* 'seven'.

[*k^ht]: OIr. *in-nocht* 'tonight' beside Lat. *nox*, gen. *noctis*, Goth. *nahts* 'night'; OIr. *ocht n-* 'eight' beside Lat. *octō*, Goth. *ahtau*; OIr. *recht* 'right' beside Lat. *rēctus*, Goth. *rahts* 'right'.

[*st]: Corn. *sterenn*, Bret. *sterenn* 'star' beside Gk. *astēr*, Goth. *stairnō*.

[*sk]: OIr. *scáth* 'shadow' beside Gk. *skótos* 'darkness', Goth. *skadus* 'shadow'.

The word-initial cluster [*sp-] is reflected in Celtic as *f-*. The lack of a stop reflex parallel to the treatment of /*t/ and /*k/ after /*s/ is due to the considerable changes undergone by /*p/ in Celtic, where it spirantizes to *f* > *x* > Ø.

The aspirated + unaspirated ordering of Series III allophones in clusters coincides with the ordering of Series II allophones in distant sequences found in the Italic area of Indo-European. The same allophonic distribution may well have been observed in distant sequences for Series II and III in the dialects that gave rise to Germanic and possibly Celtic, but any such distribution has been obscured by subsequent phonological and morphophonological changes which make it impossible to detect the original structures in the reflexes of these languages.³⁵ A distant sequence of two Series III phonemes in Germanic is usually reflected as two aspirated stops, which does not correspond to the aspirated + unaspirated distribution proposed above (although Germanic clusters do follow that model):

Goth. *hēpjō* 'room' beside Avest. *kata-* 'room', OCS *kotīci* 'chamber, cell'.

Goth. *hvaþō* 'foam' beside Skt. *kváthati* 'cooks food'.

Goth. *faíhu* 'possession' beside Lat. *pecus* 'livestock; money', Skt. *paśú-* 'livestock'.

Goth. *-faþs* in compounds: *hunda-faþs* 'commander of 100 men', *brūþ-faþs* 'bridegroom' beside Lat. *potis*, Gk. *pósis*, Skt. *pátiḥ* 'master, husband'.

Goth. *fraþi* 'sense, understanding' beside Lith. *prōtas* 'reason, mind', Toch. B *pratim* 'decision'.

Goth. *þahan* 'keep quiet' beside Lat. *taceō* '(I) keep quiet'.

These Germanic forms reflect distant sequences of Series III phonemes, and they require positing aspirated allophones for both, in violation of the aspirated + unaspirated distribution. However, in Germanic we also find a number of forms which do appear to reflect the regular Indo-European allophonic prin-

35. A distant sequence of Series II phonemes with the allophonic ordering of aspirate + nonaspirate, the opposite of the Greek and Sanskrit order, may be reflected in a few Germanic forms; however, they are rendered ambiguous by subsequent changes of intervocalic voiced consonants within Germanic. An example is OSax. *bodom*, OE *bodan* 'soil', possibly from [*b^hud-], beside Lat. *fundus* 'bottom, soil', *pro-fundus* 'deep', Gk. *puthmēn* 'bottom, soil', Skt. *budhná-* 'bottom, soil'.

ciple, reflecting a sequence of aspirate + nonaspirate; such forms suggest that Germanic originally followed the distributional principle and that it was subsequently obscured by analogical changes. The Germanic forms showing relic reflexes of the original Indo-European allophonic distribution include these:

Goth. *afhvapjan* 'put out, extinguish', from [**khwep-*], formally and semantically corresponding to the archaic Homeric *apò kapúō* in *apò dè psukhèn ekápussen* '[she] gasped the life breath from her' (Iliad 22.467, of Andromache),³⁶ Gk. *kapnós* 'smoke', Skt. *kúpyati* 'comes into motion, fury', Lat. *cupiō* '(I) want, am greedy for', *uapor* 'smoke, fumes', OIr. *accobor* 'wishes', *ad-cobra* 'wishes', Lith. *kvāpas* 'smoke, fumes', OCS *kypěti* 'boil'.

Goth. *faiflōkun* 'they wept', OE *flōcan*, OSax. *flōcan*, OIcel. *flóki*, OCS *plakati*, Lith. *plakù*, *plàkti* 'weep'.³⁷

OIcel. *flaka* 'gape', *skip-flak* 'shipwreck' beside Lith. *plėšiu* 'tear', *nuplėšti* 'tear off (clothing)', Alb. *pėlçás*, aor. *plása* 'perish, burst'.

OE *gehoff* 'follicle', *hoppe* 'capsule', comparable to Skt. *kūpa-* 'hole', Lat. *cūpa* 'cask, barrel'. This form testifies to the preservation in certain Germanic dialects of the unaspirated allophone of PIE */*p/* while the initial stop was aspirated and subsequently spirantized. Some Germanic dialects have a form with a fricative for */*p/* (OIcel. *húfr* 'body of ship'), which may be evidence of fluctuations within Germanic in the treatment of aspirated and unaspirated allophones of Series III. Such forms suggest that phonetic leveling of the aspiration feature took place in Germanic.³⁸

Traces of the ancient allophonic distribution of Series III in distant sequences can also be observed in those Indo-European dialects which neatly reflect the analogous allophonic distribution for the voiced Series II. In Sanskrit, which reflects the aspirated + unaspirated order in voiced allophones (see 1.4.1 above), relics of the same ordering of voiceless Series III allophones can be observed. The Sanskrit ordering of allophones is the opposite of that found in Germanic.

36. Since the Germanic form cannot be explained in traditional terms and yet is an indisputable semantic correspondent to the Greek one, Pokorny 1959:596 posits an *ad hoc* form with a voiced nonaspirate, **kwəb*, exclusively for Germanic, beside **kwēp*, **kwəp* for all the other forms.

37. IE **k* can be reconstructed on the evidence of the Germanic-Slavic-Lithuanian correspondence. For an alternative ancient form with **g* see Pokorny 1959:832; however, the semantic closeness of the Gothic and Slavic forms supports **k* for the Indo-European protoform. Cf. also Gk. *plēssō* (**plākȳō*) '(I) beat' and Mlr. *lén* (**plakno-*) 'wound', which together with Lith. *plakù* require a source with voiceless **k*.

38. Forms of the intensive where a geminate voiceless stop appears with an initial spirant reflecting an Indo-European aspirated allophone are significant in this regard: OSwed. *prykkja*, OE *ðryccan* 'stamp, cut out' beside Lith. *trūk-stu* 'break; burst', Welsh *trwch* 'broken, cut off'; OIcel. *hoppa*, which can be compared to OCS *kypěti*. These forms may reflect an ancient regular distribution of allophones of Indo-European voiceless consonants in Germanic.

This is consistent with the split, posited above, of Indo-European dialects into two groups based on the ordering of allophones: Indic-Iranian-Greek as against Italic-Celtic-Germanic.

The Series III phonemes of Indo-Iranian are regularly reflected as plain voiceless stops, with the exception of certain combinatory special cases which will be surveyed in detail below (specifically, aspirated allophones are preserved after *s*³⁹ and before a laryngeal). One group of Sanskrit forms may give evidence for the preservation in relic form of the Indo-European allophonic distribution for Series III:

Skt. *śākhā* 'branch', Goth. *hōha* 'plow', Slavic *soxa* 'stake; (wooden) plow', Lith. *šakà* 'branch'.

Skt. *śaṅkhá-* 'shell; bend, convolution', Gk. *kóghkhē, kóghkos* 'shell', Myc. *ko-ki-re-ja* (= *kogkhíleia* 'decorated with shells'), from IE [***Konkhō-**]. Note that Greek, which usually loses aspiration in the reflexes of aspirated allophones of Series III (with isolated exceptions, discussed below), preserves aspiration as a relic in this form.

Skt. *śaphá-* 'hoof', Avest. *safa-* 'hoof of horse', Oícel. *hófr*, OE *hōf*, OHG *huof* 'hoof', from IE [***Kophō-**].

Skt. *śaphara-* 'carp sp.' (*Cyprinus sophore*), Lith. *šāpalas* 'carp sp.' (*Cyprinus dobula*), from IE [***Kophelo-**].

Skt. *kváthati* 'cooks food'; Goth. *hvaþō* 'foam', OCS *kvasŭ* 'kvass'.

This ordering of allophones for voiceless consonants coincides with that of voiced consonants. The plausibility of this ordering is increased by morphophonological alternations in reduplicated verbal forms such as *khyā-* 'name, call', perf. *cakhyau*, where the reduplicated consonant reflects an old unaspirated allophone before the aspirated root initial. This pattern corresponds exactly to that exhibited by reduplicated forms with voiced initials, as well as to the order of unaspirated and aspirated consonants in distant sequences.

Traces of the same unaspirated + aspirated ordering of Series III consonants can also be observed in Old Armenian. Evidence comes from forms such as these:

Arm. *tarp'* 'love, desire', *tarp'am* '(I) wish, strive' (IE ***terph-**/***treph-**).

Arm. *kayt'* 'dance, joy'; cf. OHG *heitar*, Ger. *heiter* 'happy' (with the opposite allophonic distribution in Germanic).

Arm. *kop'* 'blow; smithing, forging', *kop'el* 'strike'; cf. Gk. *kóptō* '(I) hit, beat' (see Djahukian 1969).

39. Even here Sanskrit shows a pattern that is the inverse of that reflected in Germanic and Celtic. In the Indo-Iranian dialect area the aspirated allophone of a voiceless stop generally appears after *s*, while in the Celtic-Germanic area, as shown above, the unaspirated allophone appears in that environment.

1.4.4. Indo-European clusters and Bartholomae's Law

We find an analogous ordering of aspirated and unaspirated voiced phonemes in Sanskrit clusters, which would appear to reflect an Indo-European ordering of allophones in Series II clusters. A typical Sanskrit reflex of the Indo-European distribution is a form like *bhuddhis* 'awakenings, vigils' (instr. pl.) from **bhudh-bhis*, with a cluster of two Series II consonants in the order unaspirated + aspirated; the unaspirated first consonant of the cluster in turn causes the root-initial consonant to appear in aspirated form, following the usual rule for distant sequences (see above).⁴⁰ These phonetic regularities too can be explained as Indo-Iranian reflexes of Indo-European allophonic distribution in clusters. Specifically, there is an assimilative rule applying across morpheme boundaries whereby the second consonant assimilates to the first in voicing and aspiration; this is known as Bartholomae's Law. When a morpheme ending in a Series II consonant is combined with one beginning with a Series III consonant, the result is a cluster of the type that by the regular rule should produce a sequence of unaspirated + aspirated consonants in Greek and Aryan.

Indo-European verbal morphemes such as **beudh-* (Skt. *bodh-*, Gk. *peuth-*) or **leGh-* (Gk. *lékh-os* 'couch, bed'), combined with the participial suffix **-tho-*, formed the sequences **budh-* + **-tho-* and **leGh-* + **-tho-*, which by the regular rules should yield **bud-tho-* and **leG-tho-*. There is an Indo-European constraint which stipulates that combinations of unglottalized stops must be homogeneous in voicing (cf. Rule 4 above, which precludes cooccurrence of Series II and III in the same root), so we expect voicing assimilation in these forms. In Indo-Iranian the reflex of the voiceless aspirated allophone assimilates in voicing to the preceding voiced consonant to yield **buddh-* (Skt. *buddhá-* 'awakened'). In the Greek area, which is characterized by devoicing of Series II, there is assimilative devoicing, which yields **put-to-s*, with deaspiration of the Series III consonant; the result is Gk. *-pustos*, with the Greek dissimilation of *tt* to *st* (Gk. *á-pustos* 'unknowing', cf. *pústis* 'question, investigation' beside Skt. *buddhi-* 'spirit', Mayrhofer 1963:II.449-50).

Gk. *lék-tr-on* 'couch' (= OHG *leh-tar*) receives an analogous explanation. There is devoicing of the unaspirated [g] in **leg-th-*, followed by the characteristic Greek deaspiration of the originally aspirated allophone [**th*].⁴¹ Similarly, in Italic forms such as Lat. *lectus* 'couch' from [**leg-thos*], *fictus* 'molded, formed' from [**fig-thos*] (cf. *figō* '(I) mold, shape'), *uectus* 'brought, conveyed' from [**weg-thos*] the former voiceless aspirated phoneme

40. Note that the rule for aspiration of allophones applies from right to left. That is, the order of rules is defined as beginning with the rightmost element.

41. For Greek forms such as *dék-to* (< **dekh-*) we must assume a specifically Greek law whereby an aspirate assimilates to a following voiceless stop (Kuryłowicz 1973b:70).

undergoes deaspiration and devoices the preceding voiced stop.⁴²

Thus all of these processes can be uniformly interpreted as manifestations of a Proto-Indo-European regularity in the distribution of aspirated and unaspirated allophones of Series II and III, with subsequent assimilation in accordance with the principle of homogeneous voicing in clusters. The Sanskrit assimilative changes described by Bartholomae's Law⁴³ as well as the Greek and Latin correlates can be subsumed under general Indo-European phonological regularities.

There is an essential difference between the allophonic distribution in combinations of phonemes from one series (II or III) and that in heterogeneous clusters combining phonemes of the two series (which occurs only at morpheme boundaries, since cooccurrence of Series II and III within the root is precluded by Rule 4): the rule determining distribution in heterogeneous clusters is strictly limited and applies only within clusters. When homogeneous clusters are formed, as in Skt. *bhuddhis*, the distribution of allophones is determined by a rule operating from right to left and applying to the entire wordform: the aspiration of the rightmost element determines that of the consonant to its left, which in turn determines that of the next consonant to the left, and so on to the beginning of the word. But in heterogeneous clusters of Series II and III consonants formed at morpheme boundaries, the conditioning of allophones stops after the second consonant from the right, i.e. it applies only within the cluster:⁴⁴ $[*b\dot{h}udh-] + [*-tho-] \rightarrow [*budh-] + [*-tho-] \rightarrow [*bud-tho-]$. This protoform underlies Skt. *buddhá-* (with progressive assimilation in voicing) and other forms traditionally described with Bartholomae's Law, as well as Gk. *á-pustos* and similar forms: in both Sanskrit and Greek, the initial stops lack aspiration.

It can easily be seen that this interpretation of Bartholomae's Law gives a phonologically more natural and simpler explanation for the origin of Indo-Iranian clusters of plain voiced and voiced aspirate stops than does the tradi-

42. We find comparable phonological phenomena at morpheme boundaries where an Indo-European Series I (glottalized) phoneme combines with a Series III (voiceless) one. Indic forms such as Skt. *viitá-* 'famous', *sattá-* 'having sat', *áti* 'he eats' (beside Skt. *ved-*, *sad-*, *ad-* in other forms from the same roots) can be explained as preserving an Indo-European allophonic ordering of glottalized + voiceless (aspirated): $[*weít'-tho-]$, $[*set'-tho-]$, $[*et'-tho-]$, cf. Skt. *sákthi-* 'thigh' from $[sk\dot{h}ak'-thi]$, cf. Gk. *skázō* '(I) limp'. The same source forms also account for the development *-st-* in Greek and other Indo-European dialects. These questions will be considered below in connection with the development of Series I in the daughter branches.

43. Bartholomae's Law also covers the development of Indo-European palatals, which are treated below with the full system of Indo-European points of articulation.

44. The restriction is probably determined by the nature of the phonemes involved in the cluster. A cluster of consonants which differ in voicing violates the harmony in consonant voicing that was characteristic for Indo-European wordforms and hence violates the integrity of the wordform, which restricts the application of the phonological rules to specific segments of words. This disharmony was resolved only in historical times in the daughter dialects, through voicing assimilation.

tional account. In our interpretation, Bartholomae's Law is simply the assimilation of the first consonant to the second in one distinctive feature:

$$\begin{bmatrix} + \text{ aspirated} \\ - \text{ voiced} \end{bmatrix} \rightarrow \begin{bmatrix} + \text{ aspirated} \\ + \text{ voiced} \end{bmatrix} / \begin{bmatrix} - \text{ aspirated} \\ + \text{ voiced} \end{bmatrix}$$

The traditional account assumes shifts of two distinctive features (assimilative voicing and transfer of aspiration) applying to a cluster of voiced aspirate plus voiceless nonaspirate (Rule a):

$$(a) \begin{bmatrix} + \text{ aspirated} \\ + \text{ voiced} \end{bmatrix} \begin{bmatrix} - \text{ aspirated} \\ - \text{ voiced} \end{bmatrix} \rightarrow \begin{bmatrix} - \text{ aspirated} \\ + \text{ voiced} \end{bmatrix} \begin{bmatrix} + \text{ aspirated} \\ + \text{ voiced} \end{bmatrix}$$

Note that when Sanskrit is described in traditional terms there is also *atti* < **ad-ti* (Rule b):

$$(b) [+ \text{ voiced}] [- \text{ voiced}] \rightarrow [- \text{ voiced}] [- \text{ voiced}]$$

Rule (b) is in obvious contradiction to Rule (a).

1.5. The diachronic derivability of the posited phonological system and the trajectory of phonemic shifts in the daughter dialects of Indo-European

1.5.1. The diachronic derivability of the Germanic system and Grimm's Law

To what extent does our system of the three stop series answer to diachronic derivability? That is, is it possible to derive the systems of the attested Indo-European languages, naturally and using typologically verifiable transformations of these series? We find that our system of three stop series corresponds fully to synchronic typology and has no less diachronic derivability than the traditional system.

The system we posit for Indo-European stops is preserved best of all in Germanic, Armenian, and probably Anatolian (Hittite-Luwian). To transform it into the attested systems we need only minor phonetic shifts in the daughter languages.

In Germanic, the glottalized Series I is reflected as a voiceless series, which in Proto-Germanic may have had glottal articulation:⁴⁵

45. Traces of the glottal articulation can be seen in prosodic features reflected in the later Germanic languages. One of them is the laryngeal (glottal stop) articulation of the Danish and West Jutlandic *stød* and similar phenomena in North Germanic dialects, e.g. Icel. [va'tn] 'water' (Kacnel'son 1966, Liebermann 1971:137-39). A possible source for this phenomenon is a shift

IE ***t'**: OIcel. *tívar* 'gods', *Týr* 'war god', OE *Tīg* beside Skt. *devá-*, Lat. *deus* 'god', Gk. *Zeús* (gen. *Diós*): PIE ***t'eiw-**, ***t'yeu-** (= ****dyeu-**).⁴⁶ Goth. (*ga*)-*teiha*n 'show, explain', OIcel. *téa*, *tjá* 'show', OE *tēon* 'blame, speak out against' beside Skt. *diśáti* 'shows', Lat. *dīcō* '(I) say', Gk. *deíknumi* '(I) show': PIE ***t'eiKh-** (= ****deiKh-**). Goth. *itan* 'eat', OIcel. *eta*, OE *etan*, OHG *ezzan* beside Lat. *edō*, Gk. *edomai*, Skt. *ádanam* 'food': PIE ***et-** (= ****ed-**). Goth. *satjan* 'sit', OIcel. *sit*, OSax. *sittiu* beside Skt. *ásadat*, Gk. *hézomai*, Lat. *sedeō*: PIE ***set-** (= ****sed-**).

IE ***K'**: Goth. *kunnan* 'know', OIcel. *kanna*, OHG *kunnan* beside Gk. *gignōskō* '(I) know': PIE ***K'en-** (= ****ġen-**). Goth. *kniu* 'knee' beside Skt. *jānu*, Gk. *gónu*: PIE ***K'enu-** (= ****ġenu-**). Goth. *qiman* 'come' beside Skt. *gámati* 'goes', Gk. *baínō* '(I) go': PIE ***K'em-** (= ****gwem-**). Goth. *ik* 'I', OIcel. *ek* beside Lat. *egō*, Gk. *egō* 'I' (first person pronoun): PIE ***eK'-** (= ****eġ-**). Goth. *akrs* 'field', Lat. *ager*, Gk. *ágrios* 'wild, field (adj.)': PIE ***aK'r-** (= ****aġr-**).

The labial member of Series I, glottalized /p'/, was evidently missing in Indo-European. Only one or two forms supporting it can be cited, in non-initial position in forms of areally restricted distribution (see 1.1.1 above).

The voiced Series II stops with aspirated and unaspirated allophones undergo spirantization and yield the corresponding voiced spirants, which are subsequently reflected as voiced stops word-initially and voiced fricatives medially. This spirantization must have been favored by the subphonemic aspiration of the Indo-European phonemes: it is aspirated sounds that have a tendency to undergo spirantization. It has been proposed (Prokosch 1939:75-78[1954:69]) that a voiced stop appeared word-initially and a voiced fricative medially. This distribution of reflexes may continue the old distribution of aspirated and unaspirated allophones of the Indo-European Series II:⁴⁷

IE ***bh**: Goth. *baíran* 'carry', OIcel. *bera*, OE, OHG *beran* beside Skt. *bhárati*, Gk. *phérō*, Lat. *ferō* '(I) carry': PIE ***bher-**. Goth. *brōþar* 'brother', OIcel. *bróðir*, OHG *bruoder* beside Skt. *bhrátar-*, Gk. *phrátēr*: PIE ***bhrāther-**.

of the glottalization feature to a suprasegmental which characterized the whole syllable: IE ***wot-or/n-** > ***wa't-n-**. Shifts of a segmental feature to a suprasegmental are common in the world's languages (Fischer-Jørgensen 1968, Elizarenkova 1974:222-30, Hyman 1973, Ivanov 1975a).

There is a good typological parallel in the glottal dissimilation of Lahu, a Tibeto-Burman language. In Lahu under certain phonetic conditions glottalization is lost and turns into high tone, which leads to restructuring of the tonal system (see Matisoff 1970).

46. For clarity, here and below two asterisks ****** mark traditional reconstructions and a single asterisk ***** is used for ours.

47. There is a difficulty with this claim, however: in clusters of Series III, aspiration is allophonically distributed in the opposite order in Germanic: aspirate + nonaspirate. This would mean that the allophonic orderings were different in clusters and distant sequences. This question merits further investigation and must still be regarded as an open one.

Goth. *giban* 'give', OIcel. *gefa*, OE *giefan*, OHG *geban* beside Skt. *gábhastih* 'hand', Lat. *habeō* '(I) have, hold': PIE ***Ghabh-**.

IE ***dh**: Goth. *daigs* 'dough', OIcel. *deig*, OE *dāg*, OHG *teig* 'dough' beside Skt. *dehī* 'wall', Gk. *teîkhos* 'wall', Lat. *fungō* '(I) mold, shape, form': PIE ***dhe/oigh-**. Goth. *daúr* 'gate', OE *dor*, OHG *tor* beside Gk. *thúra* 'door', Lat. *forēs* 'gate': PIE ***dhwer-** / ***dhur-**. Goth. *waúrd* 'word', OHG *wort* beside Lat. *uerbum* 'word': PIE ***werdh-** / ***wordh-**. Goth. *baídjan* 'force', OIcel. *beiða*, OE *bēdan*, OHG *beitten* beside Gk. *peíthomai* '(I) convince', Lat. *fīdō* '(I) believe': PIE ***bheidh-**.

IE ***Gh**: Goth. *giban* 'give' (see above). OHG *gān* 'go', OE, OSax. *gān*, OSwed. *gā*, Crim. Goth. *geen* beside Skt. *jáhāti* 'leaves', Gk. *kikhānō* '(I) find, overtake': PIE ***Ghē-**. Goth. *gards* 'house', OIcel. *garðr* 'yard', OSax. *gard*, OE *geard* beside Skt. *gṛhā-* 'house': PIE ***Gherdh-**. Goth. *daigs* 'dough': PIE ***dhe/oigh-**, cf. above.

The reflexes of Indo-European Series III phonemes in Germanic are analogous to those for Series II. The aspirated allophones of Indo-European voiceless consonants are reflected as voiceless spirants, and the positionally conditioned unaspirated allophones are reflected as unaspirated (after *s*-⁴⁸ and after a voiceless stop: see above). Thus the shift undergone by Series III corresponds precisely to that undergone by Series II, and this fact reveals parallelism in the development of these phonetically similar Indo-European stop series.

IE ***ph**: Goth. *fadar* 'father', OIcel. *faðir*, OSax. *fadar*, OHG *fater* beside Skt. *pitár-*, Gk. *patér*: PIE ***phəthēr**. Goth. *fōtus* 'foot', OIcel. *fótr*, OE *fōt*, OHG *fuoz* beside Skt. *pad-*, Gk. *poús*, gen. *podós*, Lat. *pēs*, gen. *pedis*: PIE ***phēt-**, ***phōt-** (= ****pēd-** / ****pōd-**). Goth. *ufar* 'over', OIcel. *yfir* beside Skt. *upári*, Gk. *hupér*: PIE ***upher**.

IE ***th**: Goth. *þiuda* 'people', OHG *diot* beside OIr. *túath*, Osc. *touto*, OLith. *tautà*: PIE ***theuth-**. Goth. *uf-þanjan* 'stretch, reach', OIcel. *þenja*, OE *ðenian*, *ðennan* beside Skt. *tanóti*, Gk. *tánutai* 'stretches out, lengthens', Lat. *tendō* '(I) pull': PIE ***then-**. Goth. *brōþar* 'brother': PIE ***bhrāther-** (see above).

IE ***Kh**: Goth. *hliuma* 'hearing', pl. 'ear', OIcel. *hljóð* 'silence; sound', OE *hlēoðor*, OHG *hliodar* 'sound' beside Gk. *klé(w)ō* '(I) am famed', Skt. *śṛṇóti* 'he hears': PIE ***Khleu-**. Goth. *háiřtō* 'heart', OIcel. *hjáta*, OE *heorte*, OHG *herza* beside Lat. *cor*, gen. *cordis*, Gk. *kêr*, *kardia*: PIE ***Kher-**. Goth. *taihun* 'ten' beside Lat. *decem*, Gk. *déka*: PIE ***t'eKh̥m** (= ****deK̥m**).

In forms reflecting a Series III consonant before a stressed vowel (following an unstressed one), the fricative is voiced by Verner's Law: in Goth. *fadar*, OIcel. *faðir* the voiced *ð* is the result of voicing of the *θ* that regularly reflects IE ***th**. Consequently, in this position the reflexes of Series III and Series II

48. Typologically comparable is modern English, in which initial and postvocalic voiceless stops are phonetically aspirated but there is no aspiration after *s*: *take* [tʰeɪkʰ] but *stake* [steɪkʰ] (Bloomfield 1933:99, Hockett 1958:63, Gleason 1959:57).

coincide (Kuryłowicz 1973b:69), another indication of their former phonetic closeness.

As a result of these shifts, Germanic undergoes a restructuring of the former phonological correlations among the three stop series. The Indo-European allophonic alternation of aspiration in Series II phonemes is transformed in Germanic into one of voiced stops and voiced fricatives. The Indo-European allophonic split based on the feature of aspiration shifts to a Germanic split based on the feature of interrupted vs. noninterrupted.

An analogous spirantization of aspirated allophones of the voiceless Indo-European Series III led to more profound systemic shifts. This spirantization produced a distinct phonemic series of (voiceless) fricative phonemes /f/, /θ/, /x/, which were opposed to the voiceless stop reflexes of Series I in the feature of interruptedness (see Table 6 and the rules in (6)). The unaspirated allophones of the Indo-European Series III fell in with the reflexes of Series I in Germanic. The early Germanic voicing of pretonic aspirates by Verner's Law⁴⁹ caused the originally voiceless fricatives *f*, *θ*, *x*, *xw* to fall in with the spirantized allophones of *b*, *d*, *g* to yield the phonemes *b/β*, *d/ð*, *g/ɣ*, *gʷ/ɣʷ*.⁵⁰ Thus the reflexes of the three original series underwent regroupings which reshaped the entire phonological system of Germanic.

Table 6
The derivation of the Germanic system from Indo-European

I	II	III		I	II	III
(<i>p'</i>)	<i>bh</i>	<i>pʰ</i>	⇒	(<i>p</i>)	<i>b/β</i>	<i>f</i>
<i>t'</i>	<i>dh</i>	<i>tʰ</i>		<i>t</i>	<i>d/ð</i>	<i>θ</i>
<i>k'</i>	<i>gh</i>	<i>kʰ</i>		<i>k</i>	<i>g/ɣ</i>	<i>h</i>
				<i>kʷ</i>	<i>gʷ/ɣʷ</i>	<i>hʷ</i>

In terms of features rather than phonemes (and specifically the features which characterize series, excluding those that identify individual phonemes), these shifts can be represented as in (6):

49. Verner's Law applies only to voiceless fricatives, voicing them. It does not affect the voiceless stops, which is not entirely understandable from a typological viewpoint. A plausible explanation must be sought in the nature of the phoneme series which arose in Germanic. Voicing was phonologically distinctive for the Germanic voiceless stops reflecting Series I; it distinguished them from the reflexes of Series II. But the fricatives of Series III were not opposed to other fricatives in voicing. Their voicing in pretonic position was a purely phonetic phenomenon, and only later did it lead to a new phonological redistribution of allophones. For Verner's Law in Germanic in the light of our theory of Indo-European consonantism, see also Normier 1977.

50. The result is a phonological system typologically similar to that of modern Spanish.

- (6) a. $\left\{ \begin{array}{l} + \text{ glottal} \\ (- \text{ voiced}) \end{array} \right\} \Rightarrow \left[\begin{array}{l} - \text{ glottal} \\ - \text{ voiced} \end{array} \right] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$
- b. $\left\{ \begin{array}{l} [+ \text{ stop}] \\ [+ \text{ aspirated}] \end{array} \right\} \Rightarrow \left[\begin{array}{l} \pm \text{ stop} \\ - \text{ aspirated} \end{array} \right] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ voiced} \end{array} \right]$
- c. $[+ \text{ stop}] \Rightarrow [- \text{ stop}] / \left\{ \left[\begin{array}{l} - \text{ syllabic} \\ - \text{ voiced} \end{array} \right] \right\} [+ \text{ aspirated}]$

The phonological transformations of the original Indo-European system which have been proposed here for Germanic, transformations which led to the sound systems of the daughter Germanic languages, are substantially different from the changes accepted in classical Indo-European grammar and formulated in Grimm's Law as the first Germanic consonant shift.⁵¹ In traditional theory, attempts have been made to establish a chronology for the first consonant shift based on loans from Germanic languages into Balto-Finnic, the spelling of Germanic names by classical authors, and the Germanic treatment of loanwords from other languages (Prokosch 1939:52-53 [1954:44]). Relevant Gothic loans include *Krēks* 'Greek' (Lat. *Graecus*), *paida* 'coat, shirt' (cf. Gk. *baītē* 'coat of skins'), and others. However, the analysis of loan material cannot yield unambiguous conclusions about phonological changes, since the final conclusions depend wholly on how one conceives of the diachronic development of the phonological system in question. Observed regularities in the phonetic changes of loanwords can be interpreted as adaptations to the phonological system of the borrowing language. Thus the devoicing of Greek and Latin consonants in the Gothic forms cited above was evidently due to reshaping of these words to fit the Germanic consonantism, where the voiced stops going back to Indo-European Series II alternated subphonemically with spirants and must have had a low degree of phonetic voicing. This explains the devoicing of foreign voiced consonants in Germanic, and specifically in Gothic (see Guxman *apud* Prokosch 1954:353; Normier 1977:187).

The major changes in the Germanic stop system are essentially limited to the

51. According to Grimm's Law the First Germanic consonant shift involved the following phoneme changes:

PIE	<i>b</i>	<i>d</i>	<i>g</i>	→	Gmc.	<i>p</i>	<i>t</i>	<i>k</i>	
	<i>b^h</i>	<i>d^h</i>	<i>g^h</i>			<i>b</i>	<i>d</i>	<i>g</i>	
	<i>p</i>	<i>t</i>	<i>k</i>			<i>p^h</i>	<i>t^h</i>	<i>k^h</i>	→ <i>f</i> <i>θ</i> <i>x (h)</i>

(Prokosch 1954, Fourquet 1948, Abrahams 1949).

phonetic process of spirantization of Series II and III allophones. Although this process led to phonological restructuring of the Germanic stop system, there is no reason to speak of 'shifts' of the original phonological series in Germanic. The Germanic system preserves the original phonological traits of the ancestral Indo-European system in regard to voicing and aspiration. If anything the Germanic phonological system is archaic,⁵² close to the ancient phonological correlations of voicing and aspiration.⁵³

1.5.2. The diachronic derivability of the Armenian system

Also close to Proto-Indo-European in the phonological correlations of its consonant series, and possibly even more archaic than Germanic, is the Armenian consonantism. The glottalized Series I of Indo-European is reflected in Armenian as a voiceless stop series, glottalized in a number of modern dialects. It has been suggested that this stop series was also glottalized in Classical Armenian (Solta 1963). If this is correct,⁵⁴ then the Armenian glottalized series is a direct continuation of the Indo-European glottalized series (see also Kortlandt 1978:13ff., Hagège and Haudricourt 1978:123-25).

However, the phonological status of glottalization in Classical Armenian is substantially changed in comparison with Indo-European. If glottalization in the Indo-European Series I is phonologically distinctive and distinguishes this series from the voiceless (aspirated) Series III, in Armenian, which has phonologically distinct aspiration in its series of voiceless aspirates, glottalization becomes an irrelevant, redundant feature of Series I. This is why glottalization could be lost in a number of dialects (including, possibly, Classical Armenian):

IE *t': Arm. *tun* 'house', instr. *tamb*, gen.-dat. *tan* beside Skt. *dam-* (in *dám-patiḥ* 'master of house'), *dāmaḥ*, Gk. *dómos*, Lat. *domus*, OCS *domŭ*: PIE

52. Cf. Lehmann's earlier claim (1952) for conservatism of Germanic phonology, based on different facts.

53. Vennemann (1983), basing a historical assessment of Germanic consonantism on a model for the Indo-European stops which is identical to ours, considers it possible that the glottalization of Series I was preserved until Proto-Germanic and subsequently lost in the daughter languages; he also offers an interpretation analogous to ours for the Germanic consonant shift and Grimm's Law.

54. Frequency relations between the voiceless stops and voiceless aspirates would appear to go against the claim that the Classical Armenian unaspirated voiceless stops were glottalized: the unaspirated voiceless stops are more frequent than the voiceless aspirates (I. Melikišvili 1972). But even so it is hardly possible to extend conclusions based on the analysis of one set of texts to the entire Classical Armenian language, which can hardly have been uniform and may well have had a variety of dialects. Some of the contemporary Armenian dialects with glottalized consonants may continue those older dialects in this respect.

On the other hand, the glottalization of the Armenian affricate [c'] could be seen as evidence for the glottalization of the Indo-European Series I. The Armenian affricate is the assimilated reflex of the Indo-European glottalized velar: IE *K'en- : Arm. *cin* 'clan, birth'; IE *K'er- : Arm. *cer* 'old, elder' (discussed in more detail below).

t'om-** (= *dom-**). Arm. *tam* '(I) give', lpl. *tamk'*, aor. *etu* beside Skt. *ádām* (aor. of *dádāmi*), Gk. *dídōmi*, aor. *édōka*, Lat. *dō*, *dāre*, OCS *damŭ* '(I) give': PIE ***t'ō-** (= ****dō-**). Arm. *utem* '(I) eat' beside Goth. *itan*, Lat. *edō*: PIE ***et'-** / ***ot'-** (= ****e/od-**).

IE ***K'**: Arm. *kin* 'woman, wife', Goth. *qinō*, Skt. *gnā*, Gk. *gunē*, OCS *žena*: PIE ***K'en-ā** (= ****gwen-ā**). Arm. *karkut* 'hail' (with reduplication, according to Meillet) beside Lat. *grandō*, OCS *gradŭ* 'hail'.

There can be even less doubt about the archaism of Armenian in regard to Series II of Indo-European, the voiced (aspirate) stops. In the traditional view, the Indo-European voiced aspirates are reflected in Armenian as plain voiced stops (Meillet 1936, but for another interpretation see Meillet 1922:13). But a number of modern Armenian dialects have voiced aspirates for Series II in certain cases, which necessitates rethinking of the Armenian reflexes of the Indo-European voiced aspirates (Garibjan 1959; cf. Djahukian 1960, Fourquet 1959, Lehmann 1961, Pisani 1961, Zabrockij 1961, Makaev 1961, Ivanov 1959). Distributional analysis of the voiced aspirates in Armenian dialects indicates that the voiced aspirates and plain voiced consonants are allophones of a single phoneme, which can be characterized as distinctively voiced with non-distinctive aspiration (see Allen 1951:199-204). The voiced aspirates are found only word-initially in these dialects, while the unaspirated sounds are found non-initially. Interestingly, Benveniste 1959 and Vogt 1958 (see also Vogt 1938:327ff.) have independently concluded that Classical Armenian had voiced aspirates corresponding to Indo-European voiced aspirates (a conclusion anticipated in Pedersen's early works: 1904:336-37, 1921:45ff.). They propose that the Classical Armenian graphemes *b*, *d*, *g* represent the voiced aspirates [b^h], [d^h], [g^h].

This generally plausible interpretation can be refined by assuming that *b*, *d*, *g* reflect voiced aspirates in only some positions. To judge from contemporary Armenian dialect data, the Classical Armenian letters must stand for both aspirated and plain voiced consonants, depending on their position in the word. The aspirated and unaspirated sounds were, as they are in modern dialects, allophones of single phonemes, presumably distinctively voiced with non-distinctive, redundant aspiration (cf. also Djahukian 1967b:52). It is difficult to judge this distribution for Classical Armenian, since allophonic differences are not reflected in writing, but nonetheless an approximate pattern for Classical Armenian can be established on the evidence of modern dialect data which shows that the voiced phonemes must have had aspirated allophones in word-initial position, unaspirated allophones elsewhere.⁵⁵ This pattern must have

55. This would appear to link Classical Armenian with both the Armenian dialects lacking an aspirated/unaspirated distinction in voiced consonants, and the dialects which do have voiced aspirates. The first group of dialects results from a Classical Armenian dialectal loss of non-distinctive aspiration in voiced stops, and the second has preserved the voiced aspirates and plain

characterized the Indo-European dialect area which included ancient Armenian. We can thus conclude that Classical Armenian and a number of modern dialects have preserved almost unchanged the allophonic variation and probable distributional pattern of the Indo-European voiced Series II:

IE ***b^h**: OArm. *berem* [bherem] '(I) carry' beside Goth. *baíran*, Skt. *bhárāmi*, Lat. *ferō*, Gk. *phérō*: PIE [***b^her-**]. OArm. *-berj* [bherdz] 'height', *barjr* [bhardzr] 'high' beside Skt. *bṛhánt-* 'high', OLat. *fortis* 'strong', Goth. *baírgahei* 'mountainous area': PIE ***b^her-G^h-**.

IE ***d^h**: Arm. *duṛn*, pl. *dur-k'* [d^hurk^h] 'door' beside Goth. *daúr*, Gk. *thúra*, Lat. *forēs*: PIE [***d^hur-**]. Arm. *dizanem* [d^hizanem] '(I) heap up' beside Lat. *fungō* '(I) shape, mold', Skt. *dehī* 'wall', Gk. *teikhos* 'wall': PIE ***d^heiG-** / ***deiG^h-**.

IE ***G^h**: Arm. *gom* [ghom] 'cattle shed, pigsty' beside OIcel. *gammi* 'dugout, mud hut', Dan. *gamme* 'shed, sty': PIE ***G^hom-**.

The Indo-European voiceless (aspirated) Series III stops are faithfully reflected in Armenian in the form of voiceless aspirates [p^h], [t^h], [k^h]. [p^h] undergoes a further development word-initially: *f* > *h* > Ø, typologically comparable to the development in Celtic. [p^h] is preserved initially after *s-*, and probably also before *-s-*: cf. Arm. *ep'em* '(I) boil' beside Gk. *hépsō* id. (trans. or intrans.), see Pokorny 1959:325. Initially after *s-*, Armenian, like Sanskrit, has aspirated sounds reflecting Indo-European aspirated allophones of Series III. Intervocally, *-p^h-* yields Armenian *-w-* (by voicing of **-f-* from **-p^h-*); **-t^h-* changes to **-θ-*, then to **-h-* and finally to Ø.

IE ***p^h**: Arm. *otn* 'foot', *het* 'track' beside Lat. *pēs*, gen. *pedis*, Gk. *poús*, gen. *podós*, Skt. *pad-*: PIE ***p^het'-**, ***p^hot'-**. Arm. *hayr* 'father' (cf. OIr. *athir*), Goth. *fadar*, Lat. *pater*, Gk. *patér*, Skt. *pitár-*: PIE ***p^hathēr**. Arm. *hoviw* 'herdsman' beside Skt. *avi-pā(lá)-* 'shepherd': PIE ***owi-phā-**.

IE ***sp^h**: Arm. *p'etk* 'piece of wood' beside OIcel. *spjalkir* (pl.) 'skewers', OE *spelc*, Welsh *fflochen* 'splinter', Gk. *phelgúnei* · *asunetei*, *lērei* (Hesychius): PIE [***sp^helG-**]. Arm. *p'und* 'vessel' beside Lat. *sponda* 'prop, support, couch', Mlr. *sonn* 'pillar, column', Welsh *ffon* 'stick': PIE [***sp^hon-d^h-**]. Arm. *p'ert'* 'slice, piece' beside OIcel. *spjqr* 'scrap, rag', Gk. *sparássō* '(I) tear off': PIE [***sp^her-**]. However, there is reason to believe that PIE ***sp^h** is reflected in Armenian, as in Germanic, as ***[sp-]**, with unaspirated [p] after **-s-* (W. Winter, p.c.). This yields the sequence *sp-*: cf. Arm. *sparnam* 'threaten': Lat. *spernō* 'despise'. Then forms like Arm. *p'etk* go back to protoforms with mobile *s*, i.e. forms with initial aspirated ***[p^h]**. Analogously, PIE ***[t^h]** is reflected in Armenian as *t'*, whereas the sequence ***[st-]**, with unaspirated [t], is reflected as [st] as in Germanic.

IE ***t^h**: Arm. *t'aramim*, *t'aršamim* '(I) fade, wither, dry out' beside Gk.

voiced stops as allophones of single phonemes, in this respect continuing the correlations posited for Classical Armenian.

térsomai '(I) dry out', Skt. *tṛṣyati* 'is thirsty', Lat. *torreō* '(I) dry (s.th.) out', Goth. *þaúrspan* 'be thirsty': PIE [**ther-s-*]. Arm. *hayr* 'father', see above.

IE [**st-*]: Arm. *sterj* 'sterile' (of animals) : Goth. *stairō* id., Gk. *steîra* id., Lat. *sterilis*. Arm. *astł* 'star' : Goth. *stairnō*, OHG *sterno*, Hitt. *ḫaster-*, Gk. *astér*, Lat. *stēlla* 'star'. Arm. *z-gest* 'clothing' : Goth. *wasti*, Gk. *esthēs*, Lat. *uestis* 'clothing'.

The reflex of [**kh*] after initial [**s-*] is not entirely clear. There are examples of both *sx-* and *c'* from this source in Armenian.

IE [**Kh*]: Arm. *c'ax* 'branch' beside Skt. *śākhā* 'branch', Goth. *hōha* 'plow', Lith. *šakà* 'branch': PIE [**KaKh-*]. Arm. *lk'anem* '(I) leave' beside Lat. *linquō*, Skt. *riṇākti* 'leaves': PIE [**leiKh-*].

IE [**skh*]: Arm. *sxalem* '(I) stumble; commit offense, err' beside Skt. *skhālate* 'stumbles': PIE [**skhel-*].

The Armenian reflexes of the Indo-European stop series are shown in Table 7, and the rules for deriving them are shown in (7).

Table 7
Derivation of the Armenian system from Indo-European

I	II	III	⇒	I	II	III
(<i>p'</i>)	<i>bh/b</i>	<i>ph</i>		<i>p'l'</i>	<i>b[lh]</i>	<i>ph</i>
<i>t'</i>	<i>dh/d</i>	<i>th</i>		<i>t'l'</i>	<i>d[lh]</i>	<i>th</i>
<i>K'</i>	<i>Gh/G</i>	<i>Kh</i>		<i>k'l'</i>	<i>g[lh]</i>	<i>kh</i>

$$(7) \quad a. \quad \left\{ \begin{array}{l} [+ \text{ glottalized}] \\ (- \text{ voiced}) \end{array} \right\} \rightarrow \left\{ \begin{array}{l} [\pm \text{ glottalized}] \\ [- \text{ voiced}] \end{array} \right\} / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$$

$$b. \quad X \Rightarrow X / \left\{ \begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ + \text{ voiced} \\ [+ \text{ aspirated}] \end{array} \right\}$$

$$c. \quad [+ \text{ aspirated}] \rightarrow [+ \text{ aspirated}] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ - \text{ voiced} \end{array} \right]$$

Thus an analysis of the Classical Armenian stop system in comparison to that of

Indo-European indicates that the Armenian system is extremely archaic. The Indo-European system has undergone no significant phonological changes in Armenian. Hence there is no need to ask whether Armenian had a consonant shift analogous to that of Germanic (Fourquet 1959). The Armenian stop system reproduces the Indo-European one as regards the three series, with no essential phonological changes. The Armenian and Germanic stop systems are closest to the original Indo-European system.

1.5.3. The diachronic derivability of the Anatolian system

Also to be classed among the archaic systems is the stop system of the Anatolian (Hittite-Luwian) languages. In Hittite there are two clearly opposed stop series, distinguished in the cuneiform script by double vs. single writing of the consonant letter where the syllabic writing system permitted it, i.e. in medial (intervocalic) position. The Hittite reflexes of Series III stops are spelled with doubled consonants, while those of Series I and II are generally written single (this is Sturtevant's Law; see also Jucquois 1972):

Hitt. *i-u-kán* 'yoke' (KBo III 41 II 6), *i-ú-ga-an* (KUB VII 8 II 8), *i-u-ki* (KUB XIII 5 II 21) 'yoke': Skt. *yugá-*, Gk. *zugón*, Lat. *iugum*, Goth. *juk* 'yoke'.

Hitt. *ne-pí-iš* 'sky' (Al. A IV 26), *ne-pí-ša-aš* (2BoTU 7, 51): Gk. *néphos*, Skt. *nábhah* 'cloud'.

Hitt. *te-pu-* 'small' (MS, Vs. 4), *te-pa-u-eš* (Madd., Vs. 48), abl. *te-pa-u-wa-az* (Hat. II 21): Skt. *dabhráh* 'small', *dabhnóti* 'harms, injures'.

Hitt. *šu-up-pa-ri-ya-zi* (KUB XX 86 10) 'sleeps': Gk. *húpnos*, Skt. *svápnah* 'sleep'.

Hitt. 1sg. past *e-ip-pu-un* 'took' (KUB XIV 15 IV 36), 3pl. *e-ip-pir* (KBo III 4 II 34), ppl. *ap-pa-an-za* (KUB XIX 37 II 22): Lat. *apīscor* '(I) reach, attain', Skt. *āpnóti* 'reaches, attains'.

Hitt. *ḫa-ap-pár* (Hittite Laws, §§ 48, 69) 'price, cost', *ḫa-ap-pa-ra-iz-zi* (KBo VI 10 III 28) 'sells': Skt. *āpnah* 'wealth, possessions', Gk. *aphneió̄s* 'wealthy', Lat. *ops*, gen. *opis* 'wealth, property'.

Hitt. *kat-ta* 'under, below; in the possession of': Gk. *katá*.

Hitt. *pat-tar* 'wing': Skt. *pátatra-* 'wing', Gk. *pterón* 'feather, wing'.

Hitt. *ú-it-ti* (2BoTU 7, 10) 'year', loc. *ú-i-it-ti* (KUB IV 72, Rs. 2): Gk. *wétos* 'year', Lat. *uetus*, gen. *ueteris* 'old'.

Hitt. *wa-a-tar* 'water'; *ú-i-ti* (KBo III 8 III 2) 'in the water', *wi-ta-az* 'out of the water' (KUB XXI 19 III 17): Gk. *húdōr*, gen. *húdatos* 'water'.

Hitt. *lu-uk-kat-ta* (KBo VI 2, Rs. 47; for the Hittite forms of this root see Hoffmann 1968) 'dawns': Lat. *lūceō* 'be light', *lūx* 'light', Gk. *leukós* 'white'.

Hitt. *ne-ku-ma-an-za* (Madd., Vs. 51; KUB XIII 4 III 32) 'naked': Lat. *nūdus*, Goth. *naqaps* 'naked'.

Hitt. nom. sg. *da-lu-ga-e-eš* 'long', *ta-lu-kiš-zi* 'becomes long' (KUB VIII 6, Vs. 14, 16): Skt. *dirghá-*, Gk. *dolikhós*, OCS *dlǫgŭ* 'long' (Trubačev 1978:5.209).

Geminate spelling of a consonant going back to an Indo-European voiceless aspirated stop is found only intervocalically in Hittite writing, as is natural for the syllabic Hittite cuneiform script. There is of course no gemination in initial or final position. The spelling *i-tar* 'walking' (cf. Lat. *iter* 'road', Toch. A *ytār*), with the Indo-European suffix **-ther* / **-thor* / **-th_ṛ*, may show the Hittite reflex of **th* before syllabic sonant. This would explain the regular single spelling of *t* in the suffix *-tar*, in contrast to the normal gemination in *ki-i-ta(-ri)* 'lies', where the intervocalic *-tt-* goes back to root **-th-* (Gk. *keítai*, Skt. *séte* 'lies'), while the spelling *-ttar* of the suffix is extremely rare.

There is reason to assume that Hittite geminate spelling represents an aspirated (intensive) consonant, while single consonant letters reflect the corresponding unaspirated (non-intensive) consonants (Gamkrelidze 1961:231ff.). Then it can be claimed that the Indo-European voiceless (aspirated) consonants are reflected as Hittite voiceless aspirates, while the Indo-European glottalized and voiced aspirate consonants merged into a Hittite unaspirated series. The opposition of the two Hittite series was reflected graphically by geminate vs. single writing of consonant letters (Gamkrelidze 1959a, 1961).

The reduction of the three Indo-European stop series to two series contrasting in aspiration is a specifically Hittite phenomenon, which took place after Hittite had begun its separate development. For Common Anatolian (and for some prehistoric stage of Hittite) we can assume that there were three stop series. This is because the Hittite reflexes of the Indo-European dentals **t'*, **th*, **dh* preserve traces of the former three-way distinction in position before **i*: **t'i-* is reflected as *ší-* [si-], **-thi* yields *-zzi* [-tsi], and **dhi-* appears as *t/di-*:

IE [**t'i-*]: Hitt. *šiwatt-* 'day'; *šiwanni-*, *šuni-/šuna-* 'god', *Dšiwaz* 'deity associated with day'; cf. Pal. *D^hTiwaz*, Lat. *diēs*, *deus*, *dīuus*, PIE **t'yēus*.

IE [**-thi*]: Hitt. 3sg. ending *-zi*: *e-eš-zi* 'is', 3pl. *-anzi* (PIE **-onthi*): *a-ša-an-zi* 'are' (cf. Luw. 3sg. *a-an-ni-i-ti* 'does', pl. *hi-iš-hi-ya-an-ti* 'ties'; Pal. *atanti* '(they) eat', *aḫuwanti* '(they) drink' beside Hitt. *adanzi* '(they) eat', *akuwanzi* '(they) drink').

In Luwian and Palaic no assibilation of dentals took place before *i*, which shows that the assibilation was a specifically Hittite process. The different treatments of the original three series in Hittite assibilation of dentals show that the three series were distinct in Hittite (for the dentals and hence presumably for the other points of articulation). Hence three stop series continuing the three Indo-European series are to be reconstructed for Proto-Anatolian.

In giving a phonological interpretation to the three stop series in Hittite-

Luwian we face major difficulties imposed by the cuneiform writing. Nonetheless it is highly likely that the reflexes of Series III, written with gemination in Hittite, were voiceless aspirates and hence much like their Indo-European sources. Assibilation of the dental **tʰ* of this series produced the voiceless affricate *z* [ts]. Assibilation of the ancient Hittite reflex of **t'* yields the Hittite voiceless spirant *s*, a fact which indirectly shows that the reflexes of Indo-European Series I were voiceless. This assibilation could have taken the form of either palatalization of a plain voiceless [t] or palatalization of a glottalized [**t'*] with an intermediate stage [**c'*] (i.e. **t' > *c' > s*). In contrast to this, the voiceless aspirate yields the affricate *c* [ts] under assibilation, and this sound does not undergo subsequent deaffrication. The initial stages of the two assibilation processes must have been parallel:

$$\begin{array}{l} *t' > *c' > s \\ *t^h > c \end{array}$$

This analysis also implies that the other Hittite consonants descending from Indo-European Series I were glottalized. However, glottalization must not have been phonologically distinctive in this series, since a voiceless aspirated series existed: as in Classical Armenian, the Hittite-Luwian opposition must have been one of aspiration (or intensivity) rather than glottalization. The superfluous glottalization could have disappeared independently in the Hittite-Luwian languages; it may well have been loss of glottalization that led to the subsequent merger of Series I and II in Hittite.

As was mentioned above, the Hittite reflex of the dental stop of Indo-European Series II, **dʰ*, does not undergo assibilation before *i*, unlike the dental reflexes of Series I and III. This is the reason for positing three distinct series for a prehistoric stage of Hittite-Luwian. The lack of assibilation in the reflex of **dʰ* must be due to phonetic properties of that sound which hindered assibilation. The voicing itself may have had this effect;⁵⁶ or the responsible factor may have been aspiration, since the combination of aspiration and voicing is often segmented out to yield a sequence of stop plus aspiration (Ladefoged 1967, 1971, Lass 1974), which would have insulated the stop from the palatalizing influence of the following front vowel. Thus we can regard the Hittite-Luwian reflexes of Series II as having been voiced, with an aspirated element, at the time when palatalization operated in Hittite-Luwian. The aspiration may have been lost significantly later, possibly after Hittite separated from the other languages.⁵⁷ (For the rendition of the Series II reflexes in cuneiform see

56. Compare the lack of assibilation in Greek dialects of voiced *d* before *i* while the voiceless dental is assibilated: *ti > si*.

57. Further evidence for an early Hittite distinction of Series I and II reflexes is the recently discovered distinct treatment of Indo-European **k'o* and **gʰo* (= ***gʷ* and ***gʷʰ*) in initial position (Puhvel 1972:668, 1974) in forms such as Hitt. *karap-* 'devour', Skt. *girdāi*

Oettinger 1979:532-56.)

In summary, the reflexes of Indo-European series I and II merged into a single Hittite series,⁵⁸ one which was opposed to the reflex of Series III as unaspirated. This was represented in Hittite writing in single and double writing of the consonants. For Proto-Anatolian (Hittite-Luwian), and probably for the early independent stages of Hittite and Luwian and especially Hittite, we must posit three phonologically contrasting stop series, reflecting the Indo-European series and phonologically defined respectively as voiceless (non-distinctively glottalized), voiced (non-distinctively aspirated), and voiceless aspirated.⁵⁹

1.5.4. The diachronic derivability of the Tocharian system

The development of the three stop series in Hittite is to some extent analogous to that in Tocharian, where the reduction of series went even farther and led to the complete merger of all three into one unmarked voiceless (unaspirated) stop series written with the voiceless unaspirated consonants of the Brahmi script. However, as was the case for early Hittite, the three must originally have been distinct in Proto-Tocharian, as is shown by differential assibilation of the reflexes of dentals in Tocharian (Evangelisti 1950, 1959, Pedersen 1951; for another interpretation see Winter 1962).

IE *t̥ > Toch. ś: Toch. A *śāk*, B *śak* 'ten' beside Lat. *decem*: PIE *t̥eK̥h- (= **deK̥-).

IE *d̥h > Toch. ts: Toch. A *tsik*- 'forn' beside Skt. *dehī*, Lat. *fiŋgō*, Gk. *teikhos*: PIE *d̥heiG- / *deiG̥h- (see 1.4.1 above); Toch. A *tsāk*-, B *tsāk*- 'burn' beside Skt. *dāhati* 'burns', Lat. *foueō* '(I) heat up', *febris* 'fever', Lith. *degù*, OCS *žegq* '(I) burn': PIE *d̥heG- / *deG̥h-.

IE *t̥h- > Toch. c: Toch. A *mācar*, B *mācer* 'mother' beside Lat. *māter*: PIE

'devours', Av. *jaraiti* 'devours', Russ. *žru* '(I) devour', Gk. *bibrōskō* '(I) devour', *bráptein* 'esthlein' 'devour' (Hesychius); Hitt. *kišt*- 'go out, get extinguished', Skt. *jāsate* 'loses fragrance, becomes flat', Toch. B *kās*- 'be extinguished', Gk. *sbēnnumi* '(I) am extinguished', Hom. *sbēssai*, Lith. *gēsti*, OCS *u-gasiti* 'put out, extinguish'; cf. also Hitt. *kašt*-, *kištant*- 'hunger', possibly from the same root, beside Toch. B *kest*, Toch. A *kašt* 'hunger', Skt. *jāsuri*- 'famished' (Mayrhofer 1956:I.425) (unless the comparison to Skt. *ghas*-, Av. *gah*- 'devour (of daeva)' is correct: Toporov 1975:-2.180). The Series I *k̥^o is delabialized in initial position in Hittite, while *g̥^ho and *k̥^ho preserve labialization, cf. Hitt. *kuenzi*, *kuiš*, etc.

58. The phonetic grounds for the merger may have been articulation of the voiced aspirates with subglottal pressure (Chomsky and Halle 1968, Lass 1974; for subglottal articulation see Jakovlev 1948:328, Pandit 1957).

59. That Proto-Anatolian had three distinct series which remained distinct in the early stages of the daughter languages can also be seen in the differential reflexes in Luwian of Indo-European *k̥^h (Luwian *k*) and *g̥^h (Luwian Ø initially, contrast Hitt. *k̥h*): Luw. *iššari*- 'hand', Hitt. *kiššar(a)*-, Gk. *kheír*, cf. Skt. *hás-ta*:- PIE *G̥hes-; Luw. *immari*- 'field', Hitt. *gimri* 'in the field': PIE *G̥heim-; but Luw. *kiša*- 'comb', Hitt. *kišai*- 'comb': Mlr. *cír* 'comb', Gk. *kesklon* 'combing', *ksēō* '(I) comb': PIE *K̥hes- (Ivanov 1965, Čop 1971, Ivanov 1974).

***māther-**; Toch. B *pācer* 'father' beside Lat. *pater*, Skt. *pitár-*, Gk. *patḗr*: PIE ***phəthēr-**; Toch. B *procer* 'brother' beside Lat. *frāter*, Gk. *phrátēr*, Skt. *bhrātar-*: PIE ***bhrāther-**; Toch. B *cake* 'stream' beside Lith. *tekù*, Russ. *teku*, *teč* 'flow': PIE ***theKh-**.

1.5.5. *The diachronic derivability of systems in which the Indo-European glottalized series becomes voiced*

All of the systems surveyed so far are characterized by nonvoiced stop series (phonetically glottalized in some of them) going back to the Indo-European (voiceless) glottalized stops. In this respect they reflect certain salient properties of the Indo-European Series I. They contrast with another large group of Indo-European languages which reflect the glottalized Series I as voiced stops. These include the Indo-Iranian languages, in which Series I stops are regularly reflected as plain voiced stops, which points to a sound change that voiced the original glottalized consonants.

IE ***t'**: Skt. *dāmaḥ* 'house', Gk. *dómos*, Lat. *domus*: PIE ***t'om-**, cf. Arm. *tun*. Skt. *dādāmi* '(I) give', aor. *ádām*, Gk. *dídōmi*, Lat. *dō*, *dāre*: PIE ***tō-**, cf. Arm. *tam*. Skt. *ádanam* 'food', *átti* 'he eats', Lat. *edō*: PIE ***et'**-, cf. Arm. *utem*, Goth. *itan*, Hitt. *etmi* 'I eat'.

IE ***K'**: Skt. *gnā* 'woman', Gk. *gunḗ*: PIE ***K'en-ā**, cf. Goth. *qinō*, Arm. *kin*. Skt. *nagná-* 'naked', Lat. *nūdus*, OCS *nagŭ*, Lith. *núogas*: PIE ***ne/oK'**-, cf. Goth. *naqaps*, OE *nacod*, OHG *nackut*, Hitt. *nekumant-*.

Kortlandt 1981 considers it possible that the glottal articulation involved in the implosive 'b, 'd, 'g of Sindhi is connected to the glottalization of Indo-European Series I, as in correspondences such as Sindhi *'dianu*: PIE ***t'oH-**.

The diachronic voicing of the glottalized consonants observed in a number of the languages finds its phonetic justification in the nature of glottalized sounds, which are pronounced with glottal articulation involving the complete closure of the vocal cords. Voiced consonants also have glottal articulation, with the vocal cords drawn close or closed and vibrating. When the glottal closure is released in the phonation of glottalized consonants, and in particular before a vowel, there can be a brief vibration (opening after closure) of the vocal cords, as is characteristic of the phonation of voiced sounds. If the period of accompanying vibration is lengthened during the articulation of the glottalized consonant, the result can be a voiced preglottalized consonant (or voiced laryngealized consonant, as in Hausa) which has most of the same articulatory features as a glottalized sound. In the state of the glottis during phonation, glottalized consonants are more similar to voiced than to voiceless consonants (Ladefoged 1971:16ff., q.v. for the relation of glottalized, voiced, and voiced laryngealized consonants; cf. Merlingen 1978:257ff.).

Recent work in general phonetics indicates that voiced sounds and sounds with glottal articulation, including ejectives, are related and comprise a single natural class of sounds. They are closer to each other than are consonants with glottal articulation and voiceless consonants (Ladefoged 1971:19). Many languages with diverse phonological systems show correspondences of glottalized stops and affricates to voiced consonants (including preglottalized consonants) (see Haudricourt 1950). Good examples come from North Caucasian languages. In the Nakh family, Batsbi glottalized stops and affricates in intervocalic and word-final position correspond to Chechen and Ingush voiced stops and affricates (or, positionally, spirants):^{60, 61}

Batsbi p' : Chechen b, Ingush b

Batsbi	<i>nʃap'</i>	'sleep'
Chechen	<i>na:b</i>	
Ingush	<i>na:b</i>	

Batsbi t' : Chechen d, Ingush d

Batsbi	<i>ba'er</i>	'lip'	<i>le'ar</i>	'flow'
Chechen	<i>bald</i>		<i>liedar</i>	
Ingush	<i>bord</i> < <i>*bader</i>		<i>liedar</i>	

Batsbi k' : Chechen g, Ingush g

Batsbi	<i>č'anik'</i>	'chin'	<i>dok'</i>	'heart'
Chechen	<i>č'enig</i>		<i>dwog</i>	
Ingush	<i>č'eng</i>		<i>dog</i>	

60. This also reflects the phonetic tendency not to have two glottalized consonants within one word (see 1.3.1 above).

61. For this correspondence see also Imnajtšvili 1977:261ff., where a shift in the reverse direction is proposed, from the voiced stops of Chechen-Ingush to the Batsbi ejectives (274ff.). The basis for this argument is the fact that Batsbi voiced stops often correspond to Chechen-Ingush zero (Batsbi *sag*, Ch.-I. *saj* 'deer'; Batsbi *dada*, Ch.-I. *dā* 'father'), while "the possibility is excluded that Batsbi had ejectives corresponding to Chechen-Ingush zero." We assume that in these latter examples the original consonant was the voiced stop preserved in Batsbi but lenited or lost in Chechen-Ingush, while the examples cited in the text above show original ejectives, voiced in Chechen-Ingush after the lenition of original voiced stops. On either interpretation, however, there is interaction and phonetic similarity between ejective and voiced consonants. [Chechen-Ingush-Batsbi borrowings of words whose source form is known confirm that Batsbi is conservative and the authors' interpretation is correct: Ch. *ārzū*, I. *ārzi*, B. *arc'iv* 'eagle', from Geo. *arc'iv-i*, from Arm. *arcui*, where the ejective must be original; Ch.-I. *saj*, B. *sag* 'deer', mentioned just above, is from Ossetic *sag* 'deer'. — JN.]

Batsbi *c'* : Chechen *ʒ/z*, Ingush *ʒ/z*

Batsbi	<i>kac'</i>	'puppy'
Chechen	<i>k'ezi</i>	
Ingush	<i>k'aza</i>	

Batsbi *č'* : Chechen *ʒ/ž*, Ingush *ʒ/ž*

Batsbi	<i>mač'</i>	'mustache'
Chechen	<i>maž</i>	'beard'
Ingush	<i>mož</i>	

(Sommerfelt 1938:138ff. [corrected and retranscribed — JN])

Similar correspondences can be found in the other branch of Northeast Caucasian: Avar *c'c'ar* 'name' : Rutulian *dur*, Caxur *do*; Archi *moč'or*, Rutulian *mič'ri*, Lak *č'iri* 'beard' : Tabassaran *mižir*, Agul *mužur* 'beard'. The Proto-Daghestanian fortis glottalized affricates **c'c'*, **č'č'*, **q'q'*, **t't'* yield respectively *d*, *ʔ*, *q'*, *g* pretonically and *t*, *č*, *q*, *k* posttonically; i.e. they undergo voicing and deglottalization (see Giginėšvili 1973, 1977:106).

A similar tendency can be found in Northwest Caucasian languages (see Colarusso 1975:82). In South Caucasian (Kartvelian), Svan has instances of dissimilative voicing of ejectives: *gak'* 'nut' (from **k'ak'*, cf. Geo. *k'ak'-al-i* 'nut'), *bap'* 'priest' (from **p'ap'*, cf. Gk. *páppos*). In Ossetic, glottalized consonants in early loans from Georgian are reflected as voiced stops due to dissimilative voicing, as in *p'at'ara* > *bat'ara* (Axvlediani 1949:38n1, 1960:145). For positional deglottalization of ejectives to voiced obstruents see also Kodzasov 1967.

In Arabic dialects there are frequent instances of voicing of Proto-Semitic **q*, which was a glottalized velar stop (Cantineau 1952, Martinet 1953a), to *g*. This feature is responsible for the distinction in Arabic dialectology of *qāl* and *gāl* dialects (see Blanc 1965).

These typological parallels make it entirely plausible that the Indo-European glottalized phonemes were transformed into voiced consonants in Indo-Iranian and other Indo-European dialects, where Series I is reflected as a voiced stop series.⁶²

62. The shift of reflexes of Indo-European Series I to voiced stops is also typical of Classical Armenian in certain positions, especially after nasals: *nk*, *nt* change fairly early to *ng*, *nd* (in the ninth century A.D. in the Moscow Gospel manuscript: Meillet 1936:29). In a number of western Armenian dialects, unlike Classical Armenian, the reflexes of Series I consonants are voiced stops, while the voiced stops reflecting Series II shift to plain voiceless or voiceless aspirates. This situation is already evident in Cilician dialects of Armenia by the eleventh century A.D. (Meillet 1936:24). This switch of voiceless (possibly glottalized) consonants to voiced, and voiced (possibly aspirated) to voiceless, is a good typological analog to the shift of Series I

1.5.6. The diachronic derivability of the Indo-Iranian system

In Sanskrit we can see traces of the originally voiceless nature of Series I in morpheme combinations, as in *átti* 'he eats', *vit-tá-* 'known, famous' from PIE **et'-thi*, **wit'-tho-*; and also before a suffixed **-s-* as in Skt. *vavákṣa* (perfect) 'I grew', Avest. *uxšyeiti*, Gk. *aúksō* '(I) bring up', Lat. *auxilium* 'help' beside Skt. *ugrá-* 'strong', Avest. *aogah-*, *aogarə* 'strength', Lat. *augustus* 'elevated, noble' (from PIE **auK'-s-*); Skt. *ukṣāti* 'splashes, sprinkles', Avest. *uxšyeiti* beside Gk. *hugrós* 'moist', etc.⁶³ As a result of positional preservation of the original voicelessness in such forms, the daughter dialects have forms with morphophonemic voicing alternations in a single paradigm. In such combinatory positions there was no voicing of Series I phonemes, a fact which contributed to the rise of morphological structures with voicing alternations at morpheme junctures in Sanskrit.

The voicing of the Series I reflexes in Sanskrit (or more generally in Indo-Iranian) led to a major restructuring of Series II, originally voiced with aspirated and unaspirated allophones. The voiced stops that developed from the Indo-European glottalized stops fell in with the unaspirated allophones of Series II (the positional distribution of those unaspirated allophones is described above). The result is a split of the original voiced series, its aspirated and unaspirated allophones separating into two independent phonemic series — plain voiced and voiced aspirate. This occurred because the merger of the reflexes of the Indo-European ejectives with the unaspirated allophones of Series II destroyed the complementary distribution of the aspirated and unaspirated allophones of Series II. In Sanskrit, *b*, *d*, and *g* are already opposed to *bh*, *dh*, and *gh* as plain voiced vs. voiced aspirate stops.

The labial *b* of Sanskrit cannot be due to voicing of **p'*, as must have been the case for *d* and *g*, since the Indo-European glottalized series was defective, lacking its labial member. The *b* of this series is primarily due to reinterpretation of the unaspirated allophone [b] of the original Series II as the labial member of the new voiced series that resulted from merger of Series I with the unaspirated allophones of Series II.⁶⁴ The number of words with the voiced phoneme *b* subsequently increased because of onomatopoetic words such as

(glottalized) to voiced stops with reformation of Series II, which we have proposed for Indo-European dialects such as Greek and Italic.

63. In contrast, a glottalized Series I consonant undergoes voicing after **s*, and a spirant is subsequently voiced before this voiced stop: **-st'-* > **-zd-*, cf. Skt. *nīḍá-* 'haven, shelter, camp' < **nizda* (for details see below).

64. In isolated instances, *b* is the result of voicing of **p* in some position (intervocalically? — for references see Mayrhofer 1963:II.287), cf. Skt. *píbatī* 'he drinks', Sanglechi *pōv-*, Wakhi *pōv-*, Lat. *bibō* '(I) drink', OIr. *ibid*, OWelsh *iben* 'we drink' beside Skt. *pā-ti* 'drinks', Gk. *pō-thi* 'drink' (imper.), Lat. *pōtus* 'drinking'. Voicing occurs only in Indo-Iranian and Celtic-Italic, i.e. in dialects where the Indo-European Series I stops were voiced. For arguments that this *b* is not due to the influence of a laryngeal, see also Cowgill 1965:174, Polomé 1973.

balbalā ‘chatter, babble’, ‘*balbutire*’ (Mayrhofer 1963:II.421) and loans from other languages, e.g. *bāṇá-* ‘arrow; reed stick’ (from the Rigveda and Atharvaveda), cf. Sakai *awān* ‘bamboo’; *bílām* ‘cave, hole’ (RV 1 11, 5, 32, 11), cf. Tamil *viḷ*, Malayalam *viḷḷal* ‘cleft, crevice’, *viḷḷu* ‘opening’ (Burrow 1946:23), and others.

The oldest stage of Vedic, reflected in the archaic family books of the Rigveda, has a series of voiced stops which still shows clear traces of its historical connections to the Indo-European glottalized series: it shows the statistical correlations which are characteristic of the Indo-European glottalized Series I, namely low frequency of *b* in comparison to *g* (Elizarenkova 1974:103-9). Of course Vedic of that time had undergone the Indo-Iranian voicing of the glottalized series and its merger with the unaspirated allophones of Series II into a general voiced series. The appearance of onomatopoeic words and loans containing *b* in Sanskrit subsequently increased the functional load of *b* and produced the normal statistical correlations for a voiced series.⁶⁵

The split of Indo-European Series II into plain voiced and voiced aspirate series in Sanskrit would naturally have facilitated an analogous split of Series III into plain voiceless and voiceless aspirated stops. Deaspiration of the voiceless aspirates had taken place by Indo-Iranian times, so that the voiceless aspirated stops were preserved only in certain combinatory positions: after *s-*, before laryngeals, and in other positions mentioned above. In these environments we undoubtedly see reflected the Indo-European positionally conditioned distinction of aspirated and unaspirated allophones. The conditioning factor was subsequently lost in Indo-Iranian due to the loss of laryngeals (see Kuiper 1947, Hoenigswald 1963, 1965a, Polomé 1973) and the palatalization of dorsal stops (both processes will be surveyed for individual branches below). This created a contrast between voiceless aspirates and voiceless nonaspirates in certain positions, which in turn brought about their phonologization. The single series of voiceless stops with aspirated and unaspirated allophones split into two independent phonemic stop series contrasting in aspiration.

Sanskrit examples showing preservation of the voiceless aspirate after *s-*:

Skt. *sphúrjati* ‘becomes apparent, manifest’, Gk. *spargáo* ‘(I) abound, am filled’, Lat. *spargō* ‘(I) sprinkle’: PIE ***spherG-**.

Skt. *sphuráti* ‘flinches, starts; flounders; hurries’, Gk. *aspaíró* ‘(I) tremble, flicker’, Lat. *spernō* ‘(I) reject, disdain’: PIE ***spher-**.

Skt. *ásthi* ‘bone’ beside Gk. *ostéon*, Lat. *os(s)*, gen. *ossis*, Hitt. *ḫaštai*: PIE ***Hosth-**.

65. This interpretation shows that synchronic phonemic correlations are contingent on a number of diachronic factors. Therefore, the reasons for departures from statistical norms should be sought in diachrony, with attention given to the ways in which an exceptional system might have arisen due to changes in a statistically normal one. The dynamics of the Lifu stop system, discussed in 1.2.1n8 above, are revealing in this regard.

Skt. *stha*g- 'cover': Gk. *stégō*, Lat. *tegō* '(I) cover': PIE *(s)theK'-.

Skt. *-iṣṭha-*, superlative suffix, beside Gk. *-istos*, Goth. *-ista-*: PIE *-istho-.

Skt. *skhálate* 'stumbles, trips' beside Arm. *sxalem* '(I) stumble, make a mistake': PIE *skhel- (see Hiersche 1964).

Sanskrit forms with voiceless aspirates before a reconstructed laryngeal:

Skt. *-tha*, 2sg. perfect ending, cf. Skt. *véṭtha*, Gk. *oîstha*, Goth. *waist*, also Hitt. *-ti*, *-t* (2sg. ending of the *-hi* conjugation): PIE *-thHa.

Skt. *prṭhú-* 'broad, wide', *prṭhiví* 'earth' beside Gk. *platús*, Lith. *platūs* 'wide, flat', Hitt. *palt-ana-* 'shoulder': PIE *phṛth-H-(u)-.

Skt. *pánthās*, gen. *pathás* 'path, way', *pathi-* (in *pathi-kṛt-* 'pathmaker' beside Lat. *pōns*, gen. *pontis* 'bridge', OCS *pqŭl* 'path', Gk. *pátos* 'path, road': PIE *phṛth-H-.

Skt. *mánthati* 'twists, rubs, quakes', aor. *ámanthiṣṭām* (Rigveda III, 23, 2), fut. *manthiṣyánt-*, pass. *mathyáte*, past ppl. *mathitá-* (in the Rigveda), Khotanese Saka *maṁth-*, Oss. (*æz*)-*mæntyn* (Iron), *æz-mæntun* (Digor), Shugna *moḥ*, Yidga *mōxē* < **māḥa* beside Lith. *mentūrė*, OCS *mętq* '(I) become confused, disarrayed' (Mayrhofer 1963:II.578-80): PIE *month-H-.

There are several forms where *ph, *th, *K^h appear after s- and before a laryngeal; here both factors can be assumed to have operated to preserve aspiration:

Skt. *sphāyate* 'becomes fat, plump', ppl. *sphītá-*, *sphārā-* 'wide, large, spacious', Arm. *p'art'am* 'wealthy', Hitt. *iṣpai-* 'become satiated', Goth. *spēdiza* 'late', OE *spōwan* 'ripen, mature', Lith. *spėti* 'have time, be on time', OCS *spějŭ* '(I) have time, am on time': PIE *sph(e)H-.

Skt. *tiṣṭhati* 'stands', ppl. *sthitá-*, Gk. *hístēmi* '(I) place', Lat. *stāre* 'stand': PIE *sth(a)H-.

In Indo-Iranian, laryngeals came into contact with preceding voiceless aspirates in the zero grade, so that aspiration was preserved in the voiceless stop. From zero-grade forms, the aspiration of the stop spread to the entire paradigm (Saussure 1892, Pedersen 1926, Kuiper 1947, Hoenigswald 1963, 1965a:93-95, Polomé 1965, 1973, Kuryłowicz 1977:205ff.), a fact which would have favored the change of aspiration from a positionally conditioned phonetic feature into an independent, phonemic one. The phonemic status of aspiration was fixed when the laryngeals were lost and the preceding aspirates came into contrast with plain voiceless stops. Thus aspirated and unaspirated stops became independent phonemes which were in contrast in identical positions.

Positions of contrast also arose in Sanskrit as a consequence of the palatalization of dorsal stops. Forms with the regular distribution of aspirated and unaspirated allophones of Series III, e.g. *KōK^ha and *KonK^ho (Goth. *hōha*, Gk. *kóghē*: see 1.4.3 above) yield *sākhā* and *śanikhā-* respectively in Sanskrit after the initial dorsal stop is palatalized. The original medial aspirate is

preserved in these words, which do not have initial unaspirated stops since the earlier initial unaspirated stop has become a fricative. The aspirate contrasts with plain voiceless stops which occur in the same positions because of the earlier deaspiration of aspirate allophones of Series III.⁶⁶

The original distribution of allophonic aspiration can also be seen in Skt. *spásati* 'sees' (PIE ***speK^h-**), where the lack of voicing after initial *s-* is due to the rule providing for linear distribution of aspiration: the former aspirated stop occurred later in the word.

There are many Sanskrit forms with initial *sth-*, *sph-*, *skh-*. This is because these forms continue both protoforms with Series III (voiceless) stops following root-initial *s-* and probably also forms with prefixed ***s-** (by Siebs' Law)⁶⁷ which had an alternation of voiced (Series II) stop in forms without ***s-** and voiceless (Series III) stop in forms with ***s-**. In forms with the ***s-**, neutralization of voicing occurred after *s-* and the voiceless, unmarked member of the opposition appeared as the archiphoneme. In Sanskrit, this sound regularly appears as a voiceless aspirate, since that was the regular allophone of a voiceless stop by the rule antedating the phonemic split of Series III into two independent series. When laryngeals were lost and dorsal stops were palatalized in Indo-Iranian, the voiceless aspirates *ph*, *th*, *kh* were phonemicized and were opposed (as a single series, regardless of whether their etymological origin was in Series II or III) to the unaspirated *p*, *t*, *k*.

The rise of an independent phonemic series of voiceless aspirates in Sanskrit was facilitated by the borrowing of loanwords which contained voiceless aspirates, in particular *kh*: *khalatīḥ* 'bald', *khalah* 'cheat, swindler', *khāla* 'threshing floor', *khaṇḍa-* 'part; incomplete', *khora-* 'lame', and numerous others (see Kuiper 1948).

Sanskrit forms with voiceless unaspirated stops going back to Series III:

IE ***ph**: Skt. *pátati* 'flies', *patará-* 'flying', *pátatra-* 'wing', Arm. *t'ir* 'flight', Hitt. *pattar* 'wing', Gk. *pétomai* '(I) fly', *pterón* 'wing', OE *feðer*, OIcel. *fjǫðr* 'feather': PIE ***pheth-**. Skt. *pad-* 'foot', Gk. *poús*, gen. *podós* 'foot', Arm. *otn* 'foot', Hitt. *pata-* 'foot': PIE ***phe/ot'-**.

IE ***th**: Skt. *táratī* 'defeats, overcomes', Gk. *térma* 'goal, target', Lat. *termin* 'boundary marker', Arm. *t'arm* 'end', Hitt. *tarḫ-* 'defeat': PIE ***ther-H-**.

IE ***K^h**: Skt. *cakrá-* 'wheel', Avest. *čaxra-*, Gk. *kúklos*, OE *hwēol*, Toch. A

66. However, for reasons that are not entirely clear this deaspiration did not affect certain individual forms; this may be an archaism favored by the social and/or cultic significance of these words. Cf. e.g. Skt. *rātha-* 'wheel', *raheṣṭhā-* 'warrior' (i.e. 'one who stands on a chariot'), identical to Avest. *raθaēštā-* 'chariot', cf. OIr. *roth* 'wheel', *rethim* '(I) run', caus. *roithim* '(I) chase', *riuth* 'flight', *do-riuth* 'accurrō', *fo-riuth* 'succurrō', OHG *rath* 'wheel'. In some instances it is not clear why aspiration is preserved; there may have been special positional factors in e.g. Skt. *rikhāti* 'cut out, write', *lekḥā* 'line, trait, writing', etc.

67. For Siebs' Law see Siebs 1901, Lehmann 1952:80ff., Kurylowicz 1956:375-82, 1962:107ff.; for Slavic see Illič-Svityč 1961.

kukäl, B *kokale* ‘cart’: PIE ***K**^h*hel*-. Skt. *kravíḥ* (neut.) ‘raw meat’, *krūrā*- ‘bloody’, Gk. *kréas* ‘meat’, Lith. *kraūjas* ‘blood’, OCS *krŭvī* ‘blood’: PIE ***K**^h*reu*-.

The reshaping and phonemic splitting of the Indo-European Series II and III in Indo-Iranian are shown in Table 8 and (8).

Table 8
Derivation of the Sanskrit system from Indo-European

PIE	I	II	III	
	(<i>p'</i>)	<i>b/b^h</i>	<i>p/p^h</i>	
	<i>t'</i>	<i>d/d^h</i>	<i>t/t^h</i>	
	<i>K'</i>	<i>G/G^h</i>	<i>K/K^h</i>	
	↓	↓	↓	↘
Sanskrit	I	II	III	IV
	<i>b</i>	<i>b^h</i>	<i>p</i>	<i>p^h</i>
	<i>d</i>	<i>d^h</i>	<i>t</i>	<i>t^h</i>
	<i>g</i>	<i>g^h</i>	<i>k</i>	<i>k^h</i>

(8) Rewrite rules

- a. $\left\{ \begin{bmatrix} + \text{glottal} \\ - \text{voiced} \\ - \text{aspirated} \end{bmatrix} \right\} \Rightarrow \left\{ \begin{bmatrix} (- \text{glottal}) \\ + \text{voiced} \\ - \text{aspirated} \end{bmatrix} \right\} / \left[\begin{array}{c} - \text{syllabic} \\ + \text{stop} \\ \hline \end{array} \right]$
- b. $[- \text{aspirated}] \Rightarrow [- \text{aspirated}] / \left[\begin{array}{c} - \text{syllabic} \\ + \text{stop} \\ + \text{voiced} \\ \hline \end{array} \right]$
- b'. $[+ \text{aspirated}] \Rightarrow [+ \text{aspirated}] / \left[\begin{array}{c} - \text{syllabic} \\ + \text{stop} \\ + \text{voiced} \\ \hline \end{array} \right]$
- c. $[- \text{aspirated}] \Rightarrow [- \text{aspirated}] / \left[\begin{array}{c} - \text{syllabic} \\ + \text{stop} \\ - \text{voiced} \\ \hline \end{array} \right]$

$$c'. \quad [+ \textit{aspirated}] \quad \Rightarrow \quad [+ \textit{aspirated}] \quad / \quad \left[\begin{array}{l} - \textit{syllabic} \\ + \textit{stop} \\ - \textit{voiced} \end{array} \right]$$

Thus all of the changes that took place in the Indo-European stop system to yield the attested Indo-Iranian systems can be viewed as splits of original phonemic series and mergers of allophonic subseries into single independent phonemic series. These processes can be clearly seen in (8), a set of rewrite rules that change phonetic features of allophones into phonemic features, turning originally allophonic series into independent phonemic series and changing automatic phonetic features of the Indo-European Series I into phonologically distinctive features. The specifically Iranian stop series, in particular that of Avestan and other Eastern Iranian languages, can be derived from this Indo-Iranian system by adding rules that spirantize voiceless aspirates and merge voiced aspirates with plain voiced consonants. The result of these changes is loss of aspiration as a phonologically distinctive feature of stops in Iranian.

1.5.7. The diachronic derivability of the Greek system

Greek also belongs to the group of Indo-European dialects that shifted the Indo-European glottalized series to voiced stops; other such dialects are Celtic, Italic, and Balto-Slavic. Greek reflects the original glottalized series as *b*, *d*, *g*.⁶⁸ In typologically regular fashion the resultant voiced series fills the originally defective labial slot with *b* from a variety of sources. There are occasional instances of voicing of original voiceless **ph*, which must be relatively ancient in Greek: *bóskō* '(I) herd, feed; graze', *botḗr* 'herdsman', *bósis* 'food, fodder' ('*pastum*'), *boú-botos* 'cow pasture' beside Lat. *pāscō* '(I) herd', *pāstor* 'herdsman', Hitt. *paḥš-* 'defend', Skt. *pāti* 'defends'. Also ancient is the change of initial **mr-*, **ml-* to *br-*, *bl-*:

Gk. *broiós* 'mortal', *ámprotos* 'immortal', *ambrosía* 'food of the immortals' beside Arm. *mard* 'mortal', Skt. *mṛtá-ḥ* 'dead', OPers. *martiya-*, Avest. *mārəta-* (Thieme 1952:24ff.).

Gk. *brakhús* 'short' beside Avest. *mərəzu-* 'short', Goth. *ga-maúrgjan* 'shorten', OHG *murg(i)* 'short': PIE **mrGh-u-*.

Gk. *blittō* '(I) get honey from hive' from **mlittō*, cf. Gk. *méli* 'honey', Hitt. *melit* 'honey'.

68. Occasionally we can see evidence for the unvoiced nature of Series I in such isolated forms as Gk. *prókhnu* 'forward onto the knees' (Iliad 9.570; cf. *prókhnu apolésthai kakēs* 'to die on one's knees, pitifully') beside Gk. *gónu* 'knee', *gnúks* 'on the knees', PIE **k̑onu-*, cf. Avest. *fra-šnu-* 'having moved the knees forward' beside Skt. *pra-jñu-* 'bowlegged'.

An important source of Greek *b* was onomatopoetic formations such as *babai* 'oh!' (exclamation of surprise), *baúzō* '(I) cry, bark', *babrázō* (a verb denoting the sound of dragonfly wings), *bambainō* '(I) chatter, babble', and others (Chantraine 1968:1-2.163 et passim). Another important source was foreign borrowings. These can be dated to a fairly early period in Greek: Gk. *bāris* 'Egyptian type of flat-bottomed boat' (the source of Lat. *barca*), Late Egyptian *br*, Copt. *bari*; Gk. *bátos*, a measure of liquid, Hebr. *bat*; Gk. *bdéllion* 'bdellium', cf. Hebr. *beḏōlah*; Gk. *búblos* 'papyrus', cf. Phoen. *gbl*, Akkad. *Gublu* 'Byblos', Hebr. *Geḫāl*⁶⁹ (see Masson 1967:101-7; the initial *g* was replaced in Greek by *b* before another *b*); Gk. *bēta*, letter name: West Semitic **bêt*, etc. Other ancient loans are *baítē* 'herder's clothing of animal skins', cf. Alb. *petkë*, *petëk* 'dress' (Bonfante 1935:141ff.) (possibly from Thracian); *békos* 'bread', from Phrygian according to Herodotus (2.2; cf. Hipponax, frag. 125), cf. *bekos akkalos* in a Phrygian inscription (see Neroznak 1978:140).

In post-Mycenean Greek another source of *b* is the former labiovelar **g_w* from **K'o*: Gk. *boûs* 'bull' (Myc. *qo-u-ko-ro* 'bull herder', Gk. *boukóloi*), Arm. *kov*, Skt. *gáuḥ*, OIcel. *kýr*, OE *cū*, Toch. A *ko*.

Gk. *baínō* '(I) go', Skt. *gā-* 'go' (3sg. *jígāti* 'he goes'), Latv. *gāju* 'I went'.

Gk. *bíos* 'life', Skt. *gáyaḥ* 'clan property', *jīvāḥ* 'alive', Avest. *gayō* 'life', Lat. *uīuus* 'alive', Arm. *keam* '(I) live'.

It is interesting that the majority of onomatopoetic formations and loans have *b*. This is a manifestation of a universally valid tendency to give priority in borrowing to forms containing phonological units which are absent or infrequent in the borrowing language for historical reasons but are typologically required by the system. The result is that gaps which are typologically impermissible are filled and the resultant system is consistent with synchronic typological regularities. This can be shown by comparing Greek *b* and *g*: *g* is far less frequent in onomatopoetic and borrowed words than is *b*. In Greek, after Series I had been voiced the velar *g* that continued the dorsal stops of that series had the status of marked member of the series. A *b*, the unmarked member of a voiced series, was required in the system by the universal implicational laws for voiced consonants. The language began an intensive process of filling the unmotivated gap in its system by forming new words or assimilating foreign borrowings.⁷⁰

69. Albright (1950:165-66) has suggested that the word was borrowed into Greek before the development of *Gubla* into *Gubāl*; this would indicate a date earlier than 1200 B.C.

70. This resolves the controversy concerning how Gk. *búblos* arose from the borrowed Semitic *Gubl-*. It may also explain Gk. *búrša* 'hide, leather', if it is indeed a borrowing from Anatolian, cf. Hitt. *kurša-* 'fleece, shield' (specifically as a religious term), cf. Luw. *kuršaša-* 'military' (Meriggi 1957:63-64, Laroche 1959a:60, Popko 1974). If we assume borrowing (the comparison has already been made by Laroche 1947:75n4, Friedrich 1952:119, Gusmani 1968:32; for OAssyr. *gursānum* 'bellows; leather vessel' see Gelb 1969a; Greek *rs* instead of *rr* speaks in favor of borrowing; Chantraine 1968:202, K. Forbes 1958:271-72), we would expect

The development of Indo-European Series II stops — voiced and allophonically aspirated — in Greek, as in Italic, Celtic, and Balto-Slavic, involves significant phonetic changes which resulted in phonological restructurings. The phonetic changes are largely explained by the phonetic nature of voiced aspirates. Possible phonetic characteristics of these phonemes and in particular their aspirated allophones were given above, based on general phonetics. The consonants known as voiced aspirates can be phonetically characterized as involving a position of the glottis which is not typical of plain voiced or plain voiceless consonants (see Whitney 1889 for Sanskrit). Let us call this the third position of the glottis.

The third glottal position involves significant lowering of the glottis throughout the pronunciation of the stop, which compresses the subglottal air and causes rarefaction of the air in the supraglottal cavity. Air leaks through the intercartilaginous passage and, together with vibration of the vocal cords, gives the consonant its acoustic effect. The leakage of air occurs only after the stop release, since otherwise there could be no subglottal pressure. In modern Indo-Aryan languages such as Gujarati, the third glottal position (which characterizes the pronunciation of voiced aspirates) involves a position of the vocal cords where their back section, between the arytenoid cartilages, are open while the front (ligament) part can vibrate. This is accompanied by quickened expiration of air from the lungs, for which the term *breathy voice* is used (Ladefoged 1971:9ff.). Such consonants are close to forming a single natural class with voiceless consonants, which are pronounced with the vocal cords open in back, between the arytenoid cartilages, and hence not vibrating.

If the glottis is in the third position and the expiration of air is sufficient to prevent vibration of the vocal cords, the result is voiceless aspiration, which can cause devoicing during the stop phase. This type of phonetic development of consonants with originally voiced expiration must be posited for those Indo-European dialects in which Series II, the traditional voiced aspirates, are reflected as voiceless aspirates, as they are in Greek and in some positions in Italic. What distinguishes Greek from Italic is that in Greek there is devoicing of both allophones of the series,⁷¹ so that a separate series of voiceless aspirates

Gk. **gursa*. The shift of *g* to *b* cannot be explained as the development of a labiovelar (since then we would not expect *u* in Greek) but must reflect phonological reshaping of borrowings to accommodate typological pressures. The same explanation can account for the borrowing of Dravidian words with initial *v*- into Sanskrit with *b*- (when Sanskrit also had a *v*), e.g. Skt. *bakāḥ* 'Ardea nivea' from Tamil *vakkā*, Telugu *vakku* 'crane' (Burrow 1976:358), etc.

71. The phonetically natural devoicing of the voiced aspirated allophones of Series II in Greek could have led to the devoicing of the unaspirated allophones as well. The devoicing probably began with the aspirated allophones of this series and later also affected the unaspirated allophones. The spread of devoicing to the unaspirated allophones would have been facilitated when voiced unaspirated allophones appeared in the same word as a phoneme of the same series in its aspirated allophonic form. Then the phonetic devoicing of the voiced aspirates would produce simultaneous devoicing of an unaspirated allophone in the same word. Thus the

arose. This series then threatened to fall in with the voiceless aspirates of Indo-European Series III. Such a merger was prevented by the deaspiration of the voiceless stops reflecting Series III.⁷² However, that shift resulted in the merger of the new voiceless unaspirated reflexes of Series III with the voiceless unaspirated allophones of Indo-European Series II phonemes.

As a result of the changes described above, the Greek phonological system has three stop series: voiced *b, d, g* (from the Indo-European ejectives), voiceless aspirated *ph, th, kh* (from the Indo-European voiced aspirates), and plain voiceless *p, t, k* (from the Indo-European voiceless [and positionally aspirated] stops and also from devoicing of the unaspirated allophones of Series II). Thus the plain voiceless series of Greek includes both the reflexes of Series III and some of the reflexes of Series II (specifically, the reflexes of its voiced unaspirated allophones).

As an illustration of the changes undergone by the Indo-European stop system in Greek, the Indo-European forms discussed above, [**beudh-*], [**bundh-*], [**budh-*], [**di-dhē-*], [**Gi-Ghē-*], etc., are reflected in Greek as *peuth-*, *punth-*, *puth-*, *ti-thē-*, *ki-khē-*; while **pheth-*, **Khel-*, and **Khreu-* appear in Greek *pétomai*, *kúklos*, *kréas*. The phonemes *p, t, k* and *ph, th, kh* form two independent series in Greek, the first reflecting both Indo-European Series III and the unaspirated allophones of Indo-European Series II.

The Greek aspirated series *ph, th, kh*, which regularly reflects the allophones of Indo-European Series II **bh, dh, gh*, also includes occasional instances of reflexes of the plain Series III, with aspiration preserved for reasons that are not entirely clear. An important example is the Greek *th* in the second person singular perfect ending *-tha* (cf. Skt. *-tha* from PIE **-thHa*, see 1.5.6 above). Here the preservation of aspiration could be explained as due to the influence of the laryngeal, as it is explained for Sanskrit. However, this explanation is weakened by the unaspirated *t* in other Greek forms with an adjacent laryngeal, e.g. Gk. *platús* beside Skt. *pṛthú-*, Gk. *pátos* beside Skt. *pánthās*, etc.

Other relic aspirates going back to Series III without deaspiration include a number of Greek forms with aspirated *ph, th, kh* corresponding to *p, t, k* of other Indo-European languages, forms which have been regarded as of pre-Greek but possibly Indo-European provenience. They include *aphneió́s* 'abundant', *áphenos* 'wealth': Hitt. *ḫappin-ant-* 'wealthy', *ḫappar* 'price', Skt. *ápnas-*

devoicing of the two allophones of Series II in Greek can be seen phonetically as an assimilative change of a voiced aspirate and voiced non-aspirate within the same syntagmatic unit. In this we can see the operation in Greek of the Proto-Indo-European principle that stops within a single word must be homogeneous in voicing. The result of this combinatorily conditioned process was simultaneous devoicing of both allophones of the voiced Series II and their subsequent redistribution in the Greek phonological system.

72. It is important to note that no Indo-European dialect which preserves at least two stop series merges Series II and III, while Series I and II are susceptible to merger. This shows the markedness and dominance relations among the Indo-European stop series: Series III, the unmarked series, is more stable than the marked Series II and the even more marked Series I.

'possessions, goods', Lat. *ops* 'abundance', *Ops* 'goddess of abundance', PIE ***Hoph-**. Another example is Gk. *háphē* 'act of touching' beside *háptō* '(I) touch' (possibly cognate to Avest. *āfānte*: Pisani 1940:12). If such forms are borrowed from some pre-Greek language (Van Windekens 1952, cf. Georgiev 1941-1945; Merlingen 1962), then that hypothetical pre-Greek language must be assumed not to have undergone a consonant shift, but to have had an archaic stop system like that of Armenian or Germanic.

The changes undergone by the Indo-European stop series in Greek are shown in Table 9 and in the form of rules in (9).

Table 9
Derivation of the Greek system from Indo-European

	I	II	III
PIE	(p')	bh/b	ph
	t'	dh/d	th
	K'	Gh/G	Kh
	↓	↓	↓
Greek	b	ph	p
	d	th	t
	g	kh	k

(9) Rewrite rules

- a. $\left\{ \begin{array}{l} [+ \text{ glottalized}] \\ (- \text{ voiced}) \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} (- \text{ glottalized}) \\ [+ \text{ voiced}] \end{array} \right\} / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$
- b. $\left\{ \begin{array}{l} [+ \text{ voiced}] \\ [+ \text{ aspirated}] \end{array} \right\} \Rightarrow \left[\begin{array}{l} - \text{ voiced} \\ + \text{ aspirated} \end{array} \right] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$
- b'. $\left\{ \begin{array}{l} [+ \text{ voiced}] \\ [- \text{ aspirated}] \end{array} \right\} \Rightarrow \left[\begin{array}{l} - \text{ voiced} \\ - \text{ aspirated} \end{array} \right] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$
- c. $[+ \text{ aspirated}] \Rightarrow [- \text{ aspirated}] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ - \text{ voiced} \end{array} \right]$

These rules show the Greek phonological changes which affected the original features, changes which resulted in the transformation of the phonological correlations among the series. A critical one was the change of aspiration from a phonetic feature to a phonemic one, which occurred in Greek as in Sanskrit. The positive value of voicing was changed to negative in Series II, while the reverse change of negative to positive, with the feature becoming phonemic, occurs in Series I.

Viewed as rewrite rules, these processes can be seen as ordered:

1. Deaspiration of the aspirated allophones of Series III (Rule 9c)
2. Devoicing of both allophones of Series II (Rules 9b and 9b')
3. Voicing of Series I (Rule 9a)

This ordering may reflect the historical relative chronology of the processes.

1.5.8. *The diachronic derivability of the Italic system*

In Italic, Series I and III underwent a development parallel to that of Greek, yielding respectively voiced and voiceless stops which were phonemically opposed in voicing. However, Series II developed somewhat differently, and this is what distinguishes the Italic, and specifically Latin, system from that of Greek. In Italic, the aspirated allophones of the voiced Series II stops of Indo-European are reflected as the voiceless aspirated spirants *f*, *θ*, *h*, which evidently arose from spirantization of voiceless **ph*, **th*, **kh*, which in turn go back to Indo-European voiced aspirated phonemes. Thus for Italic we must posit devoicing of the aspirated allophones of the voiced Series II,⁷³ analogous to what happened in Greek. **θ* from **dh* falls in with *f* in initial position fairly early in Italic. Intervocally, the Italic, and specifically Latin, voiceless spirants undergo voicing. Schematically:

Initial position:

- [*bh] > Ital. **ph* > Lat. *f*- (via **φ*)
- [*dh] > Ital. **th* > **θ* > Lat. *f*-
- [*Gh] > Ital. **kh* > **x* > Lat. *h*-
- [*gho] > Ital. **khw* > **xw* > Lat. *f*-

73. The phonetic shift of the Indo-European voiced aspirates to voiceless aspirates in Italic must have entailed a shift of the original voiceless aspirates (Series III) to plain voiceless stops and their merger with the unaspirated allophones of Series II. This would have preceded the spirantization of the new voiceless aspirates. In general, this shift of Series III stops can be characterized as their phonologization as plain voiceless stops due to the loss of phonetic aspiration in their former aspirated allophones.

Medial position:

- [*bh] > Ital. **ph* > **φ* > **β* > Lat. -*b*-
 [*dh] > Ital. **th* > **θ* > **δ* > Lat. -*d*- (Osc-Umbrian **θ* > *f*)
 [*Gh] > Ital. **kh* > **x* > Lat. -*h*-
 [*gho] > Ital. **khw* > **xw* > Lat. -*u*- (see Allen 1958)

Examples:

[*bh-]: Lat. *ferō* '(I) carry', Umbr. *fertu*, *arsfertur* 'priest' : Skt. *bhārāmi* '(I) carry', *prá-bhartar-*, Avest. *fra-bəratar-* 'priest' (from *'bringer'), Goth. *baíran* 'carry', Gk. *phérō* '(I) carry'.

[*dh-]: Lat. *faciō*, *fēcī* '(I) do, make', Osc. *fakiiad*, Umbr. *façia*, *fakust* : Gk. *títhēmi*, Skt. *dádhami* '(I) put, place'.

[*Gh-]: Lat. *hortus* 'fenced-off piece of land', Osc. *húrz*, *húrtúm* : Gk. *khórtos* 'fenced-off area; sheepfold', Goth. *gards* 'house'.

[*gho-]: Lat. *formus* 'warm' : Gk. *thermós* 'warm', Skt. *gharmá-* 'heat', OCS *gorěti* 'burn'.

[-bh-]: Lat. *albus* 'white', Umbr. *alfu* : Gk. *alphós* 'white lichen', OHG *albiz* 'swan', Hitt. *alpa-* 'white'. Lat. *nebula* 'fog' : Skt. *nábhaḥ* 'cloud, sky', Hitt. *nepiš* 'sky', Gk. *néphos* 'cloud'.

[-dh-]: Lat. *medius*, Osc. *mefiai* : Skt. *mádhyah*, Avest. *maiḍya-*; Gk. *méssos*, Goth. *midjis* 'middle'. Lat. *uidua* 'widow' : Skt. *vidhāvā*, Goth. *widuwō*, OIr. *fedb*, OPruss. *widdewu*, OCS *vidova*.

[-Gh-]: Lat. *uehō* '(I) convey', Umbr. *arsueitu* 'aduehitō', *kuveitu* 'conuehitō' : Skt. *vāhati*, Avest. *vazaiti* 'conveys', OCS *vezq* '(I) convey'.

[-gho-]: Lat. *nūit* 'it snows', *niuem* (acc.) 'snow' : Gk. *nípha* 'snow', *neíphei* 'it snows', Avest. *snaēžaiti* 'it snows'.

In certain positions — adjacent to *r*, before *l*, and after *u* — [-dh-] is reflected as -*b*-, which points to a shift of [-dh-] to [-th-] to [-θ-] with subsequent voicing to *b* (Allen 1958): Lat. *ūber* 'udder' beside Skt. *ūdhar*, OE *ūder* 'udder'; Lat. *uerbum* 'word', Umbr. *uerfale* 'uerbāle', 'templum efflātum' (T.I. VI A 8), Goth. *waúrd*; Lat. *ruber* 'red', Osc. *Rufriis* (personal name), *rufra*, *rufru* : Skt. *rudhiráh*, Gk. *eruthrós*, OCS *rŭdrŭ* 'red', Oícel. *roðra* 'blood'.

Italic shows unquestionable reflexes of Series II with the stop feature preserved, i.e. reflexes which do not show the Italic shift to voiceless fricatives and secondary Latin voicing that must be posited for the above forms. The preservation of the stop feature is determined by certain combinatory conditions which go back to Indo-European.

Examples include Latin forms such as *uēctus*, past passive participle of *uehō* '(I) convey'; *lēctus* 'bed, couch' beside Goth. *ligan* 'lie', OHG *liggen* 'lie', Gk.

lékhos, *léktron* 'couch', Russ. *lože* 'couch', from PIE **leGh-*;⁷⁴ Lat. *nix*, gen. *niuis* 'snow' beside *nūit* 'it snows'; Lat. *uēxī*, perfect of *uehō* '(I) convey', from old -s- suffixed forms like Skt. *ávākṣam*, OCS *věsŭ*; Lat. *uexō* '(I) irritate, cause to move', *uēctis* 'lever', cf. Gk. *okhleús* 'lever'; Lat. *abdō*, *abdidī*, *abditum*, '(I) separate out, put aside' (from PIE **dhē-*, Ernout and Meillet 1967:179) beside Skt. *apa dádāhāti*, Gk. *apo-títhēmi*, cf. Lat. *ob-dō*, *sub-dō*. There can be no question that forms like *abdō* preserve not only the stop feature but voicing as well: Lat. *ab-dō*, *ob-dō*, *sub-dō* from **ap-dō*, **op-dō*, **sup-dō* show voicing assimilation in the preceding stop, which proves that the following -d- must go directly back to the voiced stop of Indo-European Series II.⁷⁵

The alternation of Lat. *uehō* : *uexō*, *uectus*, *uectis* or *nix* [nik-s] : *niuis* shows that the voiced **g^h* of Indo-European Series II was reflected as a plain voiced stop which underwent positional devoicing at a fairly early period in Italic (cf. the positional devoicing of Series II reflexes in Greek). The result was paradigmatic alternations such as *uek-/ueh-*, *nik-/niu-*, where the first allomorph shows the stop before a voiceless consonant (*t* or *s*) and the second shows the intervocalic development.

The Indo-European voiced Series II develops in the same way into voiced stops for which no spirant stage need be posited in the position after a nasal. Sequences of the type **mb^h*, (**nd^h*), **ng^h* appear in Italic as *mb*, (*nd*), *ng*:

IE **mb^h*: Lat. *ambō*, *ambae* 'both', OLat. *ambi-*, *ambiguus*, *ambulō*, Umbr. *amb-oltu* 'ambulatō', *ambretuto*:⁷⁶ Gk. *ámphō* 'both', Toch. A *āmpi* 'both'.

**nd^h*: Lat. *condō* '(I) join together, collect', with prefixed *con-* and verb (from the root **dhē-*, corresponding in sense to Gk. *sun-títhēmi* '(I) join together'), *conditor* 'founder, creator', *Conditor* 'name of god', which preserves the archaic meaning 'the one who puts grain into the barn'. The form reflects the combination of preverb *con-* < **k_m-* and **dhē-*, cf. Hitt. *-kan... dai-* 'put': Josephson 1972:239, 242, 287.

74. Lat. *lectus* is archaic, as shown by the absence of a cognate verb and the rarity of the nominal formation in **-tho-*, which has a formal and semantic correspondent in Hitt. *šaša-* 'couch' from *šeš-* 'sleep, rest', Skt. *sás-*.

75. Prefixation of *dō-* by *ab-*, *ad-*, *ob-*, *sub-*, *con-* in *abdō*, *addō*, *obdō*, *subdō*, *condō* is ancient and goes back to Proto-Indo-European: see Tronskij 1960:252. Analogous prefixation of **dhē-* is found in other Indo-European languages as well, which proves its antiquity: cf. Lat. *condō* and the Celtic prefixed forms OIr. *con-dartaiteir* 'they would be given' (3pl. pass. pres. cond.), *con-dartin* (1sg. imperf. cond.), where *con-* is cognate to Lat. *con-* and *tarti* is from **to-ro-ad-dīt* (**-dīt* < **dhē-*), perf. *do-rat* < **to-ro-ad-dar*: Thurneysen 1946:35, Pokorny 1959:236. Cf. also Old Hittite structures like *-kan... dai* (*-kan* < **k_m* > Lat. *con-*), *-šan... dai* (*-šan* < **s_m* > Gk. *sun-*): *nu-kán iš-na-an ha-aš-ši-i da-a-i* 'and [s/he] puts the dough into the hearth', ... *ha-aš-ši-ya-aš-ša-an ti-an-zi* 'and (they) put (it) into the hearth'. Thus the Latin prefixed forms can be claimed to continue the ancient Indo-European distribution of stops in clusters. This is why we have the discrepancy in the reflexes of **dh* in the verb root **dhē-*, with *d* in the prefixed forms but *f* in the same Italic root in other positions: Lat. *fāci*.

76. Umbrian *amprehuu* can be derived from **am-prae-ito*, Osc. *am-fret*: Vetter 1953:11, 183.

***nGh**: Lat. *angō* '(I) squeeze, make narrow', *angustus* 'narrow', *angiportus* (= *uīcus angustus*) 'narrow street; dead end' : Gk. *ágkhō* '(I) strangle, smother', Skt. *amhu-*, OIr. *cum-ung*, Goth. *aggwus* 'narrow', OCS *qzŭ-kŭ*, Lith. *aĩkštas* 'narrow'.

***ngħo**: Lat. *anguis* 'serpent' (ancient religious term) : Skt. *áhiḥ*, Gk. *óphis* 'snake, serpent', Mlr. *esc-ung* 'eel' ('water snake'). Lat. *unguis* 'nail, claw' : Gk. *ónuks*, gen. *ónukhos* 'nail, claw', Skt. *áñghriḥ* 'leg', OPruss. *nage* 'leg', OCS *noga*, Russ. *noga* 'leg, foot', *nogot* 'nail'.

These forms show that in some positions the voiced stops of Series II develop directly into Italic plain voiced stops. For such forms there is no need to posit devoicing and spirantization followed by voicing. It is natural to assume that it is the voiced unaspirated allophones of Series II that we see in these Italic forms, while in the other positions, where devoicing and spirantization must be posited, it is the aspirated allophones that are continued.

If there are combinatory positions in Italic that preserve the unaspirated allophones of Series II, it can be assumed that there are also other positions where the phonemes of this series behaved analogously and show up as unaspirated allophones. The combination of such positions plus those discussed just above will give us the complete distribution of the unaspirated allophones of Series II in Indo-European.

One of the most likely positions for the appearance of unaspirated allophones is the second position in non-adjacent sequences of Series II (voiced) stops. Forms such as Lat. *fidō*, *offendix*, *fiber*, *fidēlia*, *foueō*, *fiṅgō*, *habeō* (see 1.4.2 above) can plausibly be derived from [***bheid-**], [***bhend-**], [***bhe-ber-**], [***bhid-**], [***dhego-**], [***dheG-**], [***Ghab-**], and not (as is traditionally assumed) from protoforms where both consonants were voiced aspirates as a result of devoicing, spirantization, and subsequent voicing of the second consonant. In these forms there is a purely superficial coincidence of the unaspirated allophones of Series II voiced stops and the secondarily voiced reflexes of aspirated allophones of those same stops.⁷⁷

With this interpretation we can establish the Italic distribution of phonemes of Series II in non-adjacent sequences.⁷⁸ The ordering of the Italic pho-

77. In Italic forms with two non-adjacent Series II consonants where the second consonant follows *n*, not only the second position in the non-adjacent sequence but probably also the presence of the adjacent *n* condition the unaspirated allophone.

78. This order of Series II consonants can also be illustrated with Umbrian and Oscan data. Comparison of the Osco-Umbrian forms with their Latin cognates shows that there is a common Italic treatment of the allophones of Series II stops. The Umbrian forms *habe*, *habetu*, *pre-habia*, *pre-hubia* are consistent with Lat. *habeō*; *habiest* can also be assumed for Oscan on the basis of the uncertain spelling *hafiest* (Ernout and Meillet 1967:288). The Oscan perfect subjunctive *hipid*, fut. *hipust* 'habuerit' show an unaspirated reflex of the second consonant, consistent with the distributional pattern of Latin (with secondary devoicing). We find the same fluctuation in reflexes of the second consonant in Osc. *felhúss* 'walls' (gen. pl.) ('*mūrōs*') (cf. Lat. *fiṅgō*, *figūra* above) beside Osc. *fiḱikus* 'you will have created' (Vetter 1953:43, Lejeune

nemes⁷⁹ is the opposite of the Greek-Aryan ordering. In Italic the second consonant of such a sequence is unaspirated and the first aspirated.

The same distribution can also be assumed for clusters in Italic. This is how we explain Lat. *crēdō* '(I) believe', descended from a compound such as Skt. *śrad-dhā* 'believe': *śrāt te dadhāmi* 'I believe in you' (RV X, 147, 1): PIE ***Khret'-dhē-** > ****k̑hred-dhē-**.⁸⁰ In Latin the first *d* (from PIE ***t'**) is lost (with compensatory vowel lengthening) and the second (from ***dh**) is preserved, cf. the reflexes of the same ***dh** in Lat. *abdō*, *condō*, etc. Loss of the first *d* and compensatory lengthening are fully understandable in the sequence *dd*, from PIE ***t'dh** via intermediate ***ddh**. The first *d* was voiced by the general voicing of ejectives in Italic, and is of course entirely natural before another voiced consonant. The intermediate ***ddh** could only have yielded *dd*, with an unaspirated allophone for the second consonant, according to the regular Italic rule for ordering of allophones of Series II in clusters.

In clusters where a glottalized (Series I) stop preceded a voiceless stop, the Italic reflex of the ejective should be a voiceless consonant: in this position the ejectives did not undergo voicing, as in the analogous development of Sanskrit. The loss of glottalization in the first stop caused compensatory lengthening of the preceding vowel (Lachmann's Law):

Lat. *āctus* from *āgō* '(I) lead', Osc. *acum*, *actud*, Gk. *ágō* (PIE ***ak'-thos** > Ital. ***āk-tos**).

rēctus from *rēgō* '(I) rule', cf. OIr. *ro-recht* 'expansum est', 'is expanded', Goth. *raih̥ts* 'euthús', 'straight' (PIE ***reK'-thos** > Ital. ***rēk-tos**).

tēctus from *tēgō* '(I) cover', Gk. *stégō* (PIE ***theK'-thos** > Ital. ***tēktos**).

cāsus from *cādō* '(I) fall' (PIE ***Khat'-thos** > ***kāt-tos** > Ital. ***kāsos**).

ēsus from *ēdō* '(I) eat', Gk. *edomai*, Hitt. *e-it-mi* (PIE ***et'-thos** > ***ēt-tos** > Ital. ***ēsos**).

uīsus from *uīdeō* '(I) see', Gk. *oīda*, Skt. *vēda* '(I) know' (PIE ***wit'-thos** >

1955:145) and OFal. *fifiked* 'finxit'. These forms show that there was some instability in the treatment of the second consonant, probably due to assimilation and probably in late Italic (and not affecting Latin). Cf. also forms with initial Series I stops, e.g. Umbr. *teitu* beside *deitu*, Osc. *deikum*, Lat. *dicere*, which may reflect a general tendency to unify the voicing or unvoicing of consonants within the root.

79. The only Latin form that appears at first glance to contradict this ordering is *barba* 'beard', usually regarded as from Lat. **farfā* < **farθā* (cf. It. *farfecchie* 'mustache'): IE ***b̑hardhā**, cf. OHG *bart*, OCS *brada*, Lith. *barzdā*. The Indo-European form is found only in a set of western dialects and is evidently a compound of ***b̑har-** 'bristle' and ***dhē-**: [***b̑har-dhē-**] (see Specht 1944:87, Pokorny 1959:110), cf. Olcel., OHG *burst*, OE *byrst* 'bristle', Skt. *bhṛṣṭi-* 'edge', cf. Olcel. *skegg* 'beard' and *skagi* 'protuberance' (Buck 1949:205, § 4.142). In that case the Latin word represents a sequence of two adjacent stems, and the initial consonants developed independently of each other, since each was word-initial: cf. ***dh-** > *-f-* in Latin compounds in *-fer* such as *frūgifer* 'fruit-bearing', *ignifer* 'fire-bearing', *lūcifer* 'light-bearing' (Ernout and Meillet 1967:227ff.).

80. In Italic, as comparison with Celtic shows (OIr. *cretim* '(I) believe', Welsh *credaf*, MBret. *cridiff*), the compound nature of the word was lost early. For ****** usage, see note 46.

*wīt-tos > Ital. *uīsos*).

Where the stem-final consonant is the dental *t', there is vacillation in the length of the preceding vowel: we find forms with long vowels and one with a short vowel: Lat. *sēssus* from *sedeō* '(I) sit' (PIE *set'-thos).⁸¹

The compensatory lengthening of the vowel is caused not by positional devoicing of a voiced stop (the traditional interpretation of Lachmann's Law: see Niedermann 1949:68-69, Safarewicz 1969:77-78, Tronskij 1960:98-99, 278-79) but by some phonetic factor not connected with voicing (probably glottalization). This is shown by the fact that compensatory lengthening does not take place when devoicing occurs in otherwise similar clusters whose first member reflects Series II:

Lat. *uēctus* from *uehere* 'convey, drag', Skt. *vāhati* 'conveys', Gk. *okhéō* '(I) convey' (PIE *weGh-thos > Ital. *weg-tos > *uēk-tos*).

lēctus from *legō* '(I) collect', Gk. *lékhos* 'couch' (PIE *leGh-thos > Ital. *leg-tos > *lēk-tos*).

fōssus from *fodiō* '(I) dig', Skt. *budhná-*, Gk. *puthmén* 'bottom' (PIE *bhodh-thos > Ital. *fod-tos > *fōssus*).

It must be assumed that the Latin lengthening by Lachmann's Law is to be connected with the glottalization of the adjacent consonant: schematically, -V'C'C- > -V'CC- > -VCC-. Lachmann's Law, which is still central to the prosody of later Latin (see Bohnenkampf 1977), directly reflects the linguistic situation that arose as the glottalization was being lost from Series I in Italic (see also Kortlandt 1978a:117). The lengthening under the influence of the glottalization (laryngeal articulation) of a following stop can be compared to the rise of prosodic *stød* in Germanic (see 1.5.1n45 above). It is also typologically comparable to the effects of Indo-European laryngeals on vowel length (as discussed in more detail below). Hence Latin forms such as *fōssus* from *fodiō* '(I) dig', *strīctus* from *stringō* '(I) pull, draw', usually mentioned as exceptions to Lachmann's Law (Safarewicz 1969:78, Niedermann 1949:70-71), are not actually relevant, since Lachmann's Law applies only to forms with reflexes of Indo-European Series I.⁸²

81. *Sessus*, with its short *e* and geminate consonant, could have come from the regular **sēssus* by transfer of the vocalic length to the following consonant. This process is found in a number of other cases, e.g. the etymologically correct **Iūpiter* (beside Gk. *Zeū Páter*), which turned into *Iuppiter* (with transfer of vowel length to the following consonant): see Collinge 1975:230.

82. The long vowel of the participial forms *rēctus*, *tēctus*, etc. has been traced to analogy based on the morphophonological structure of the past tense (*rēx-*, *tēx-*: Watkins 1962:37; Kuryłowicz 1968a gives a somewhat different morphophonological interpretation of the length; cf. also Strunk 1976). But unless we adopt further, complex analogical devices this account does not explain the absence of length in forms such as *uēctus*, which also has a long vowel in its aorist form: *uēxī*. Latin participial forms make a fairly clear distinction of length depending on the origin of the consonant: those with consonants of Series I have long vowels and those with Series II have short vowels. This distinction shows that vowel length in these forms is more

The Italic forms discussed above and their cognates allow us to establish a picture of the shifts of the three Indo-European stop series in Italic and the later development of the Italic phonological system. In early Italic, Series II split into two phonemic series: a voiceless aspirated stop series and a voiced stop series; the two reflect respectively the aspirated and unaspirated allophones of the voiced stops of Indo-European Series II. The Italic voiced series merged with the voiced reflexes of the glottalized Series I. The early Italic phonologization of the voiced stops and voiceless aspirates probably occurred precisely because the unaspirated allophones of Series II had fallen in with the voiced reflexes of Series I.

Related to these changes is the deaspiration of the aspirated allophones of the voiceless Series III. The original Italic reflexes of the aspirated allophones of Series II threatened to merge with the aspirated allophones of the voiceless Series III; this led to the loss of aspiration in the allophones of Series III and their shift to plain voiceless stops. Consequently, early Italic acquired a system which still distinguished three stop series: voiced, voiceless aspirate, and plain voiceless.

The next stage was the spirantization of the voiceless aspirates, which became fricatives and in a number of contexts underwent combinatory voicing (Martinet 1950). The resultant voiced stops fell in with the pre-existent series of voiced stops. The stop system was transformed by elimination of the voiceless aspirated series in favor of a voiceless fricative series.

The Series I phonemes, which had shifted to voiced stops *d*, *g*, *gw* in Latin (as in Greek and Indo-Iranian), thereby produced an Italic voiced stop series which acquired a labial *b* member when the unaspirated allophones of Series II merged with Series I in Italic. Additional instances of *b* were able to arise subsequently through combinatory voicing of spirants and their shift to stops. (In Osco-Umbrian, *b* also arises through the shift of **gw-* to *b-*: Osc. *bivus* (pl.) 'living (things)' : Lat. *uīuī*.)

Another way in which the voiced series was expanded to include *b* in Latin was onomatopoeic or expressive formations such as *balbus* 'babbler', *balbō* '(I) babble, talk much'. Another was foreign borrowings, including some from Italic languages (e.g. Lat. *bōs* 'bull; cow' from a dialect of the Osco-Umbrian type) and some from elsewhere (Lat. *bōca* 'bogue [fish species, *Box vulgaris*]' : Gk. *bōks*, Ernout and Meillet 1967:72; Lat. *ebur* 'ivory', Egypt. *3bw*, Copt. *ebu*, etc.: Laughton 1956, Laroche 1965a:56-57, Masson 1967). There were also some further combinatory processes, such as the change of *-p-* to *-b-*⁸³ in

likely to have had a phonetic basis. For criticism of the morphological explanation of Lachmann's Law, see Collinge 1975, and also Drachman 1980.

83. In isolated rare instances voiceless (aspirated) consonants are voiced in some dialects. This accounts for the Celtic *b* in OIr. *ab* 'river', gen. *abae*, Welsh *afon*, OBret. *Abona* (cf. *Abou potamoû* in Ptolemy), which has secondary voicing of **p^h* instead of the loss that is regular for

bibō '(I) drink', the change of *dw-* to *b-* as in the *dwi-* > *bi-* of Lat. *bi-* 'two-' in Lat. *binī* 'two', *bonus* 'good' from **dwenos*; and the change of initial **mr-* to *br-*: Lat. *breuis* 'short', Gk. *brakhús*, cf. Goth. *gamaúrgjan* 'shorten'. All of these processes bring about the regular expansion of the voiced stop series to include a phoneme /b/ — the labial member that is typologically unmarked for this series. The result was that the Latin stop series was consistent with cross-linguistically regular frequency correlations for the labial and velar phonemes.⁸⁴

The shifts of the three Indo-European stop series in Italic are shown in Table 10 and the rules of (10) and (10').⁸⁵

(10) Rewrite rules for the early Italic system

- a. $\left\{ \begin{array}{l} [+ \text{ glottalized}] \\ (- \text{ voiced}) \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} (- \text{ glottalized}) \\ [+ \text{ voiced}] \end{array} \right\} / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$
- b. $X \Rightarrow X / \left\{ \begin{array}{l} - \text{ syllabic} \\ + \text{ consonantal} \\ + \text{ voiced} \\ [- \text{ aspirated}] \end{array} \right\}$
- b'. $\left\{ \begin{array}{l} [+ \text{ voiced}] \\ [+ \text{ aspirated}] \end{array} \right\} \Rightarrow \left[\begin{array}{l} - \text{ voiced} \\ + \text{ aspirated} \end{array} \right] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \end{array} \right]$

initial position in Celtic: cf. Skt. *ap-* 'water, river', Hitt. *ḫa-ap-pa* (in KUB XXXI 74 Vs. II 9': *ḫa-ap-pa an-da še-iš-te-en* 'rest = sleep in the river'), OPruss. *ape* 'stream', *apus* 'spring, well', Lith. *ùpė* 'river', Latv. *upe* 'river', with original **p^h* (Ivanov 1980:80-81).

b apparently also arises through assimilation to a following voiced consonant, e.g. in Skt. **ap-bhis* (instr. pl.) > **ab-bhis*, the source of the attested *adbhīs*, *adbhyās* (dat. pl.), with dissimilation of *bbh* to *dbh* (cf. *nádbhyas* from **napdbhyas*: Wackernagel and Debrunner 1930:III.§ 131b, Mayrhofer 1956:1.29-30, Thieme 1953:578, Thumb and Hauschild 1958:1, I. §§ 145, 303). Lat. *amnis* can easily be derived from a form with an original voiceless *p*: **H₂ap^hnis*, cf. Pal. *ḫappaš* (Carruba 1970:20ff., cf. Hamp 1972, where the voicing of the *-b* is traced to the influence of a laryngeal as in *pībati*, with assimilation to the following nasal: **-pn-* > *-mn-*). The parallel Hittite spelling *ḫa-pa-a* (KUB XIII 3 III 29, 32) can easily be explained as due to graphic properties of cuneiform, in which doubling of a consonant is often omitted in writing. Therefore, *contra* Watkins 1973a, there are no grounds for reconstructing two series of words for this root.

84. The normalization of statistical correlations between the labial and velar phonemes in the voiced series is also favored by the fact that the marked member of this series, the labiovelar *g^w*, turns into *w* in all positions except after *n*.

85. We note that Miller (1977), who denies that the Indo-European voiceless stop series could have been aspirated, gives an incorrect interpretation of our view of the reflexes and development of the aspirates in Italic.

$$c. \quad [+ \textit{aspirated}] \Rightarrow [- \textit{aspirated}] \quad / \quad \left[\begin{array}{l} - \textit{syllabic} \\ + \textit{stop} \\ - \textit{voiced} \end{array} \right]$$

(10') Rewrite rules for the late Italic system

$$a. \quad X \Rightarrow X \quad / \quad \left[\begin{array}{l} - \textit{syllabic} \\ + \textit{stop} \\ + \textit{voiced} \end{array} \right]$$

$$b. \quad \left[\begin{array}{l} + \textit{stop} \\ + \textit{aspirated} \end{array} \right] \Rightarrow \left\{ \begin{array}{l} [- \textit{stop}] \\ [+ \textit{aspirated}] \end{array} \right\} \quad / \quad \left[\begin{array}{l} - \textit{syllabic} \\ - \textit{voiced} \end{array} \right]$$

$$c. \quad [- \textit{aspirated}] \Rightarrow [- \textit{aspirated}] \quad / \quad \left[\begin{array}{l} - \textit{syllabic} \\ + \textit{stop} \\ - \textit{voiced} \end{array} \right]$$

Table 10
Development of the Italic system from Indo-European

IE	I	II	III
	(p')	b/bh	ph
	t'	d/dh	th
	K'	G/Gh	K'
	↓	↓	↓
Early Italic	b	ph	p
	d	th	t
	g	kh	k
	gw	khw	kw
	↓	↓	↓
Late Italic	b	f	p
	d	θ	t
	g	x > h	k
	gw	xw > hw	kw
	↓	↓	↓
Latin	b	f	p
	d	f	t
	g	h	k
	gw	w	kw

1.5.9. The diachronic derivability of systems with merger of Series I and II. The Celtic and Balto-Slavic systems

The Celtic and Balto-Slavic languages comprise a distinct group of Indo-European dialects, in which Series I and II merge into a single stop series.⁸⁶ The merger yields a new series of voiced stops *b, d, g*. The phonetic changes made in the original stop series can be characterized as voicing of the glottalized consonants and probable deaspiration of the aspirated allophones of Series II.⁸⁷

IE ***b^h**: OIr. *berim* '(I) carry', Lat. *ferō*, Gk. *phérō*, Goth. *baíran*, Skt. *bhárāmi*. OIr. *gaibid* 'takes', Lat. *habeō* '(I) have', OHG *geban* 'give'.

IE ***t'**, ***d^h**: OIr. *dét* 'tooth', Welsh, Bret. *dant*, Lat. *dēns*, gen. *dentis*, Goth. *tunþus*, cf. Hitt. *adant-*, Skt. *dant-*. OIr. *mid-* 'middle', Gaul. *Medio-* (in place names), Lat. *medius*, Skt. *mádhyah*.

IE ***K'**, ***G^h**: OIr. *gein* 'birth', Lat. *gignō* '(I) give birth', Gk. *gígnomai* '(I) am born'. Gaul. *legasit* 'he placed', Welsh *lle* 'place', Gk. *lékhos*, *léktron* 'couch', Lat. *lectus* 'couch', Goth. *ligan* 'lie'.

The Indo-European Series III is reflected in Celtic as the voiceless aspirates **p^h*, **t^h*, **k^h* (Lewis and Pedersen 1954:68-69, 74-75), with aspiration preserved at least in some positions.⁸⁸ In Celtic this aspiration is not phonemic, since the Celtic reflexes of Series III are opposed to those of the merged Series I and II in voicing only. Aspiration in Celtic is only a subphonemic feature. It is preserved as a relic in the voiceless stops of Celtic, a fact which allows us to reconstruct some patterns for the distribution of aspirated and unaspirated allophones in Indo-European Series III (cf. Vendryes 1908:23):

IE ***p^h**: OIr. *seir* 'heel', Welsh *ffêr* 'ankle', Lat. *spernō* '(I) push away, reject', Skt. *sphurāmi* '(I) throw off'. OIr. *ibim* '(I) drink', Skt. *píbāmi*, Lat. *bibō* '(I) drink'.

IE ***t^h**: OIr. *lethan* 'wide', Gaul. *Litano-briga* 'large city' : Gk. *platús*, Skt. *pr̥thú-* 'wide'.

IE ***K^h**: OIr. *lóchet* 'shining; lightning', Lat. *lūx* 'light', Gk. *leukós* 'white',

86. An analogous merger of Series I and II stops can also be assumed for Hittite. The phonological character of the merged series in Hittite may have differed from that of Celtic, but the fact that precisely these two series merged and Series III was preserved as voiceless aspirated (as is treated in more detail below) can serve as a phonological isogloss uniting these two systems.

87. A typologically comparable phonetic deaspiration and merger of voiced aspirates with plain voiced stops took place in Iranian, as can be established by comparing Sanskrit forms, which in this regard evidently continue the original Proto-Indo-Iranian situation, with Iranian ones.

88. Indo-European ***p^h** is lost in Celtic, through a series of changes *f > h > Ø*. Note that, despite all the changes undergone by the Indo-European phonological system in Celtic, the markedness of the labial member of the voiceless stops is preserved. When the original glottalized series shifted in Celtic to a voiced series in which the functionally least marked member was the labial *b* (from IE ***b^h**), the aspirated *p^h* became the most marked phoneme in the system and was accordingly lost in Old Irish.

Goth. *liuhap* 'light'.

As Table 11 and the rules of (11) show, in general the Celtic reflexes of Series III are identical to their Indo-European sources, despite the merger of Series I and II in Celtic. The voiced series produced by the merger is correlated with the reflexes of Series III in Celtic in the same way as in the original system.⁸⁹

Table 11
Derivation of the Celtic system from Indo-European

I	II	III
(p')	bh	ph
t'	dh	th
K'	Gh	Kh
↙ ↘		↓
b		ph
d		th
g		kh

(11) Rewrite rules

- a. $\left\{ \begin{array}{l} [+ \text{ glottalized}] \\ (- \text{ voiced}) \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} (- \text{ glottalized}) \\ [+ \text{ voiced}] \end{array} \right\} / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ \hline \end{array} \right]$
- b. $[+ \text{ aspirated}] \Rightarrow [- \text{ aspirated}] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ + \text{ voiced} \\ \hline \end{array} \right]$
- c. $X \Rightarrow X / \left\{ \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ - \text{ voiced} \\ \hline \end{array} \right] \right\} [- \text{ aspirated}]$

Shifts very similar to these are found in the Balto-Slavic languages. Series I

89. Table 11 and rules (11) are somewhat simplified in that they do not take account of the labiovelars, whose shifts are essential to understanding the intermediate stages in the evolution of the Celtic system from Indo-European. The table and rules should be regarded as showing only the initial and final stages of the derivation; the intermediate links will be given below, in connection with the reflexes of labiovelars (see I.2.2.2n8).

and II merge into a general voiced series as a result of voicing of the glottalized Series I and deaspiration of the aspirated allophones of the voiced Series II. But traces of the original phonological distinction between these series can be seen in their different effects on adjacent vowels in Balto-Slavic. Winter (1978) has shown that a sequence of short vowel plus glottalized stop (the traditional voiced stop) appears in Baltic and Slavic in the form of long vowel with acute intonation plus voiced stop; while the sequence of short vowel plus voiced aspirate yields a sequence of short vowel plus voiced stop. This shows the same influence of the glottalized Series I stop on an adjacent vowel as can be seen in the *stød* of Germanic or the vowel lengthening by Lachmann's Law in Italic (see Kortlandt 1977:319ff., 1978b).⁹⁰

An example where Baltic and Slavic show a long vowel with acute intonation adjacent to a former glottalized stop is PIE **t'aiwē-* 'husband's brother': Skt. *devár-*, Arm. *taygr*, Hom. Gk. *dāēr*, Lat. *lēuir*, OHG *zeihhur* beside Lith. *dieveris*, Latv. *diēveris*, OCS *děverŭ*. The Baltic long acute in a form lacking a laryngeal, unexplainable from the traditional viewpoint (see Szemerényi 1977b:87), can be explained as due to the original glottalization of the preceding **t'*.

Balto-Slavic proceeded farther than Celtic, deaspirating the voiceless Series III and hence losing phonetic voicing in that series, which was opposed to the voiced one only in phonologically irrelevant voicing.

IE **bh*: Lith. *bēbras* 'beaver', OPruss. *bebrus*, Russ. *bober*, Lat. *fīber*, OHG *bibar*, Skt. *babhrúh* 'brown'. Lith. *debesis* 'sky', Latv. *debess*, OCS *nebo*, gen. *nebese*, Hitt. *nepiš* 'sky', Skt. *nábhas-* 'sky, fog', Gk. *néphos* 'cloud', Lat. *nebula* 'fog'.

IE **t'*, **dh*: Lith. *ėdu* '(I) eat', Latv. *ēst*, OPruss. *īst* 'eats', OCS *jamŭ, jastŭ* '(I) eat', 'eats', Lat. *edō*, Gk. *édomai*. Lith. *dėti* 'put, place', Latv. *dēt*, OCS *děti*, Gk. *ítēhēmi*, Skt. *dádhāmi*.

IE **K'*, **Gh*: Latv. *gùovs* 'cow', OCS *govędo*, Russ. *govjadina* 'beef', Skt. *gáuḥ*, Gk. *boús* 'bull'. Lith. *genù* '(I) chase, drive', *giñti*, OCS *gonjŭ* '(I) drive', Skt. *hánti* 'beats', pl. *ghnánti*, Hitt. *kuenzi* 'kills', pl. *kunanzi*.

IE **ph*: OPruss. *poieiti* 'drinks', Lith. *puotà* 'drinking bout', OCS *pijŭ* '(I) drink', *piti*, Skt. *pāti* 'drinks', Gk. *pínō* '(I) drink'.

IE **th*: Lith. *mótė* 'woman', gen. *moteŕs*, Latv. *māte* 'mother', OPruss. *mūti*, *mothe*, OCS *mati*, gen. *matere*, Skt. *mātár-*, Gk. *mētēr* 'mother'.

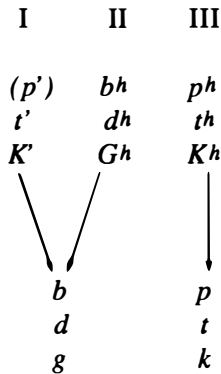
IE **Kh*: Lith. *kraūjas* 'blood', OPruss. *krawian* 'blood', OCS *krŭvŭ*, Lat. *cruror* 'blood', Skt. *kravíḥ* 'raw meat', Gk. *kréas* 'meat'.

The shifts transforming the original Indo-European system into the Balto-

90. Kortlandt (1977:319) writes of the regular reflex of short vowel plus voiced (i.e. glottalized) stop observed by Winter: "Thus, the glottal articulation in Latv. *pēds*, *nuōgs* represents the same kind of *a posteriori* evidence for the theory of glottalic consonants as the initial velar of Hitt. *hanti*, *ḫastai* once provided for the laryngeal theory."

Slavic one are shown in Table 12 and the rules of (12).

Table 12
Derivation of the Balto-Slavic system from Indo-European



The feature rewrite rules for Balto-Slavic are identical to those for Celtic, except for (12c) (cf. Celtic (11c)).

- (12) a. $\left\{ \begin{array}{l} [+ \text{ glottalized}] \\ [- \text{ voiced}] \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} [- \text{ glottalized}] \\ [+ \text{ voiced}] \end{array} \right\} / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ \hline \end{array} \right]$
- b. $[+ \text{ aspirated}] \Rightarrow [- \text{ aspirated}] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ + \text{ voiced} \\ \hline \end{array} \right]$
- c. $[+ \text{ aspirated}] \Rightarrow [- \text{ aspirated}] / \left[\begin{array}{l} - \text{ syllabic} \\ + \text{ stop} \\ - \text{ voiced} \\ \hline \end{array} \right]$

1.5.10. Classification of the daughter dialects based on their reflexes of the three stop series. The Germanic consonantism as archaic. Reinterpretation of Grimm's Law

The transformations of the three Indo-European stop series in the various dialect groups make it possible to rank the dialects for their archaicness and

closeness to the Indo-European system. The stop system which is most transformed from the original one is the late Tocharian system, in which all three series have merged into one, which was written using the signs for the Indic voiceless unaspirated stops. Next comes the Balto-Slavic system, then Celtic, which partly preserves the phonetic aspiration of allophones of Series III. Italic and Greek have a number of shared innovations in their treatment of the allophones of Series II. Italic retains the voicing of the unaspirated allophones of Series II, while Greek devoiced both aspirated and unaspirated allophones of this series. Phonologically more radical shifts took place in the Indo-Iranian consonantism, in which there is a symmetrical split of Series II and III into four independent series: voiced, voiced aspirated (these first two retain their original phonetic character), voiceless, and voiceless aspirated.

All of these systems can be grouped together based on their treatment of the Indo-European glottalized series: in all of them the glottalized series undergoes voicing and merges with the reflexes of Series II. In this respect they are opposed to a group of systems in which Series I retains its originally voiceless nature, while Series III remains voiceless and aspirated. This small group of archaic dialects includes Anatolian, Germanic (with subsequent spirantization of Series II and III), and Armenian. Armenian is the most conservative in its retention of the original phonological correlations among the three series, if we assume that voiced aspirates and plain voiced stops existed in Classical Armenian as allophones of a single voiced series. In this respect Armenian can be regarded as the most archaic of the Indo-European languages.

For most branches of Indo-European the phonological transformations can be described in terms of splits and mergers of the original three stop series. Such processes have occurred to a significant extent in those systems (e.g. Indo-Iranian, Greek, Italic) which were considered the most archaic in their consonantism in classical Indo-European studies. On the other hand, those that have traditionally been considered the most innovative due to consonant shifts (Germanic, Armenian) now prove to be the most archaic and closest to the original Indo-European stop system.

Consequently, the well-known Grimm's Law (that part of it that concerns the First Germanic consonant shift), which describes shifts of consonantism in Germanic, proves to be an inadequate account of the phonological processes that must have taken place in Germanic. If there is any reason to speak of consonant shifts in any Indo-European daughter language, then — judging from the final results — that would be most appropriate for languages such as Indo-Iranian, Greek, Italic, and others, i.e. those classically regarded as closely reflecting the Indo-European consonantism.

Chapter Two

The Indo-European points of stop articulation and the Indo-European sibilants: Paradigmatics and syntagmatics

2.1. The phonological characteristics of the consonant orders¹

2.1.1. *Phonetically natural orders of stops: anterior and posterior*

The system of three Indo-European stop series and the rules for their changes in the daughter branches given above were based on the assumption that Indo-European had at least three orders of consonants based on their points of articulation. These orders are the vertical columns in a phoneme chart showing the paradigmatic correlations of the Indo-European stops. These orders were described above as labial, dental, and velar.

The phonetic and phonological nature of the labial and dental orders can be unambiguously established from their attested reflexes. The labials consisted of stops with bilabial articulation, which in terms of acoustic features were low in tone ([+ low tonality] or [+ peripheral]) and noncompact ([– compact]). As labials, these consonants were phonetically flat. In contrast, the dentals had apical articulation and were acoustically non-low in tone ([– low tonality], i.e. [– peripheral]) and noncompact ([– compact]). Thus the labial and dental orders were opposed in tonality.

Labials and dentals together are opposed as noncompact, or diffuse, to velars, characterized by compactness. The diffuse labials and dentals can be grouped together as anterior, articulated in the front part of the mouth (farther to the front than *s*). The opposed compact consonants can be characterized as non-anterior, or posterior, articulated farther back than *s* (see Chomsky and Halle 1968:304). The boundary between anterior and posterior consonants can be defined as the point of articulation of compact-diffuse or hissing-hushing spirants and affricates such as the Abkhaz (Bzyb dialect) *ž*, *š*, *g̊*, *č*, *č'*. All sounds with major articulatory closure or obstruction farther back than this point will be defined as posterior (non-anterior); all sounds articulated in front of this point will be called anterior (non-posterior).

Sounds articulated on the boundary point between anterior and posterior, and

1. [*Order* is used, in this chapter and occasionally elsewhere, to refer to points of articulation. *Series* continues to be used, as it was in Chapter One, only of manners of articulation. — JN.]

phonologically defined as compact-diffuse (i.e. anterior-posterior), display a strong tendency to shift to either anterior or posterior. An example is provided by the development of such consonants in Abkhaz dialects.

The anterior stop order of Indo-European is opposed to the posterior order, defined in acoustic-feature terms as low in tone ([+ low tonality], i.e. [+ peripheral]) and compact ([+ compact]). This order includes stops traditionally defined as velar. Judging from their reflexes in the attested languages, they must have been true velars of the type of *k*, *g*, articulated with the back of the tongue against the front part of the soft palate (the velum).

Thus we can positively reconstruct three stop orders for Indo-European, articulated in the three main articulatory zones of the oral cavity: labials, dentals, and velars. This is consistent with typological data showing that consonants articulated at these three positions are common among the world's languages. Consonants produced at these positions can be regarded as the most natural in the sense that they arise most simply and easily from the configuration of the mobile articulators in the oral cavity (cf. Trubetzkoy 1958, 1960:142ff., Milewski 1967).

2.1.2. A typology of modifications of the basic stop orders

The basic phonological orders, comprising consonants articulated at the three major points of articulation, can be modified by the addition of coarticulations. Such coarticulations include labialization (rounding), palatalization (softening), and velarization (hardening).

Labialization is the superimposition of a *w*-like coarticulation on the basic articulatory features, while palatalization is the superimposition of a *y*-like coarticulation (Ladefoged 1971:59ff.). These modifications can lead to the appearance of new phonemic orders, marked in comparison to the basic three and in some sense complementary to them in the phonological system.

Labialization can function as a coarticulation for all three basic orders (including the labial order: see Chomsky and Halle 1968:307; for Burmese see Trubetzkoy 1958, 1960). However, it is most often the velar order that acquires labial coarticulation to yield [*k^w*, *g^w*], and much less commonly the dental [*t^w*, *d^w*]. Thus a labialized velar order is unmarked in relation to a labialized dental order. This means that labialization combines more easily with posteriority than with anteriority (see Chomsky and Halle 1968:309ff.).

The phonological feature of labialization may be phonetically manifested as intensive accessory rounding of the lips, or as velarization or pharyngealization, which automatically results in rounding. According to Jakobson, Fant, and Halle 1962, labialization and pharyngealization are variants of one and the same accessory phonological feature. Labialization and velarization, and possibly also

pharyngealization, do not occur together in the same system as independent distinctive features. The fact that labialization can take the form of two different phonetic variants explains a number of shifts that have affected the Indo-European labialized consonants in the daughter languages.

The accessory feature of palatalization (or softness, a term descriptive of its acoustic effect) can accompany all consonants except for palatals. Thus there can be accessory orders of palatalized labials, dentals, and velars, all marked in comparison to the basic three. The typology of possible systems is shown in Tables 1 and 2.

Table 1
Basic consonant orders

<i>b</i>	<i>p</i>
<i>d</i>	<i>t</i>
<i>g</i>	<i>k</i>

Table 2
Basic and modified consonant orders

plain		labialized		palatalized	
<i>b</i>	<i>p</i>	(<i>bo</i>)	(<i>po</i>)	<i>b̂</i>	<i>p̂</i>
<i>d</i>	<i>t</i>	<i>do</i>	<i>to</i>	<i>d̂</i>	<i>t̂</i>
<i>g</i>	<i>k</i>	<i>go</i>	<i>ko</i>	<i>ĝ</i>	<i>k̂</i>

Table 2 shows the kind of system that can arise when labialization and/or palatalization is phonemic.² Some of the more marked accessory orders may be missing in such systems. For instance, labialized dentals may be missing in a system which has labiovelars; and labialized labials are even more likely to be absent.³ Labiovelars are the unmarked order in comparison to the two other labialized orders.

2. Since the palatalized and labialized stop orders, i.e. those with accessory articulatory features, figure as independent phonemes opposed to the corresponding simple (unmodified) stops, it is preferable to represent such phonemes with single graphic symbols utilizing diacritics which are not identical to signs used for independent phonemes. Thus for the labialized *dʷ*, *gʷ*, etc. we will use the symbols *do*, *go*, and for palatalized *dʲ*, *gʲ* we will use *d̂*, *ĝ*. Since in Indo-European linguistics the palatalized velars are usually written *ĝ*, *k̂*, etc., we will use these symbols as well as the *ĝ*, *k̂* usually employed in general phonetics.

3. An opposition of a labialized labial order to an unlabialized labial order is extremely rare. Examples can be found in Nupe (Chomsky and Halle 1968:311), Kutep (Ladefoged 1964, 1971:61), Ubykh (Vogt 1963), and Burmese (Trubetzkoy 1958). An example of a language with both labialized velars and labialized dentals is Abkhaz (see Deeters 1963, Lomtadidze 1976).

The typological behavior of palatalized consonants is somewhat different. There are systems which have a palatalized velar order but no palatalized dentals or labials (e.g. Abkhaz), but the most common system is that with palatalized dentals but no palatalized velars or labials. The velar and labial orders are thus marked among palatalized consonants; for examples showing the typology of the palatalization correlation in Eurasia, where the dentals predominate among palatalized orders, see Jakobson 1971a:l.163ff.

The marked nature of palatalized velars in comparison to palatalized dentals explains the instability of palatalized velars and their tendency to change in one of two directions: eliminating the distinctive palatalization feature by turning it into a purely phonetic feature (so that the palatalized series merges with the plain velars), or shifting to a separate order of compact posterior affricates, *ʒ* and *č*. Such affricates are characterized by relative stability compared to other orders (and specifically anterior, or diffuse, affricates): Trubetzkoy 1958:116ff., Chomsky and Halle 1968:420ff., Serebrennikov 1974:127ff., I. Melikišvili 1976:106.

2.2. The Indo-European velar orders

2.2.1. *The plain velars*

The reflexes in the daughter languages show that an order of basic velar stops **k'* **gh* **kh* must be posited for Indo-European. These stops are reflected as velars in the individual dialects:

IE **k'*: Skt. *yugám*, Gk. *zugón*, Hitt. *i-ú-ka-an*, Goth. *juk*, OE *geoc*, Oícel. *ok*, OHG *juch*, *joch*, OCS *igo* 'yoke'. Skt. *sthápati*, *stthagayati* 'covers', Gk. *stégō* '(I) cover, defend', OCS *ostegŭ* 'clothing'. Skt. *ugrá-* 'strong', Avest. *ugra-* 'strong', Lat. *augeō* '(I) increase', *augustus* 'high, majestic', *augmentum* 'augment', Goth. *aukan*, *auknan* 'increase', Lith. *áugti* 'grow'.

IE **gh*: Skt. *megháh* 'cloud', Avest. *maēya-* 'cloud', Arm. *mēg* 'fog', Gk. *omíkhlē* 'fog, mist', Lith. *miqlà* 'fog', Slav. **mīqla*, Russ. *mgla* 'mist'. Skt. *stighnoti* 'ascends', Gk. *steíkhō* '(I) ascend', Goth. *steigan*, OCS *stignq* '(I) attain'. Lat. *hostis* 'alien, enemy', *hospes* 'guest', Goth. *gasts*, Oícel. *gestr*, OHG *gast*, OE *giēst* 'guest', OCS *gostī*.

IE **kh*: Gk. *keskíon* 'combings, tow', Hitt. *kišai-* 'comb', Lith. *kasà* 'braid', OCS *češq* '(I) comb', Oírl. *cír* 'comb'. Lat. *lūcus* '(sacred) woods', Skt. *loká-* 'empty place, space', Lith. *laūkas* 'field', OE *lēah* 'field, forest', OHG *lōh* 'forest'. Skt. *kraviḥ*, Gk. *kréas* 'raw meat', Lat. *cruor* 'blood', Mírl. *crú* 'blood', Lith. *krùvinas* 'bloody', *kraūjas* 'blood'.

2.2.2. The labiovelar order

The reflexes of the posterior stops in one part of the Indo-European dialects give reason to posit the existence of modified orders in addition to the basic, unmodified velar order. The correspondences permit reconstruction of a separate order of posterior stops with the accessory feature of labialization (or pharyngealization). This order was opposed to the unmarked plain velar order by the feature of labialization.

The correspondences in question include, first of all, that between plain velar stops and combinations of velars with a following *w* or other labial phoneme. Dialects having plain velars in such correspondence sets include Indo-Iranian, Armenian, Balto-Slavic, and Albanian:

Skt. *á-gā-m* 'I came' (aorist), *gāti-h* 'walking', Arm. *ekn* 'he came', Lith. *góti* 'go', Latv. *gāju* 'I went', Alb. *ngā* '(I) run' < **gan-yō*: cf. Goth. *qiman* 'come', Toch. A *kum-* 'come', Gk. *baínō* '(I) go', Osc. (*kúm-*)*bened* 'con-venit', 'approaches, comes up (to)', Lat. *ueniō* (< **gweniō*) '(I) come'.

Skt. *gnā* 'wife of god', Avest. *gənā-*, *ynā-* 'wife', Arm. *kin* 'wife, woman': cf. Goth. *qinō*, Gk. *gunē* (cf. Boeot. *banā*), OIr. *ben*, gen. *mná*, Welsh *ben-yw* 'female', Messap. *benna* 'wife'.

Skt. *gáuḥ* 'bull', Arm. *kov* 'cow', Latv. *gūovs*, Russ. *govjadina* 'beef': cf. Gk. *boûs* (Myc. *qo-u-ko-ro* 'boukóloi'), Lat. *bōs* (from dialectal Italic), OIr. *bó*, OHG *chuo*, Toch. A *ko* 'bull'.

Skt. *ghnānti* 'they beat', Arm. *ganem* '(I) beat', *gan*, gen. *gani* 'beating', Lith. *genù*, *giñti*, OCS *gŭnati* 'chase, drive', Alb. *gjanj*: cf. Gk. *phónos* 'murder', Hitt. *kuenzi* 'kills', pl. *kunanzi*, Oícel. *guðr*, *gunnr* 'battle', Lat. *dē-fendō* '(I) defend', OIr. *gonim* '(I) kill' (3sg. perf. *geguin*), *guin* 'wound'.

Lith. *sniēgas* 'snow', Latv. *sniegs*, OCS *sněgŭ*: cf. Gk. *nípha*, Lat. *niuem* (acc.) 'snow', *ninguit* 'it snows', Goth. *snaiws*, Welsh *nyf* 'snow'.

Skt. *káḥ* 'who, where', Lith. *kàs*, OCS *kŭ-to*: cf. Lat. *quis*, *quod*, Hitt. *kuiš*, Goth. *hvas*, Gk. *poû* 'where'; Toch. A *kus*, B *kuse* 'who'.

Skt. *ca-kr-* 'wheel, circle', OPruss. *kelan*, OCS *kolo* 'wheel': cf. Oícel. *hvél*, OE *hwēol* 'wheel', Gk. *kúklos* 'circle', Toch. A *kukāl*, Toch. B *kokale* 'cart'.

To account for this series of correspondences it is essential to reconstruct a modified labiovelar order of Indo-European stops in addition to the plain velar order. The modified order can be defined as a labiovelar one consisting of glottalized **k'o*, voiced **gho*, and voiceless **kho*. Thus we have an unmarked velar order and a labiovelar order: *k' gh kh k'o gho kho*.

The reconstructed labiovelars, especially those of Series I and III, are best preserved in Latin and Germanic, where they are reflected as single labiovelar phonemes: Goth. *kʷ* (written with the special sign *q*) and *hw* (written with the

special sign *hv*, distinct from *h*); Lat. *g^w* (written *gu*) and *k^w* (written *qu*) (see Tronskij 1960:58, Niedermann 1874 [1949:84]). Table 3 shows the feature matrix for the labiovelars.

Table 3
Feature matrix for labiovelars

	<i>k'o</i>	<i>gho</i>	<i>kho</i>
Syllabicity	–	–	–
Stopness	+	+	+
Voicing	(–)	+	–
Glottalization	+	(–)	–
Labiality	(–)	(–)	(–)
Dentality	(–)	(–)	(–)
Velarity	+	+	+
Aspiration	(–)	±	±
Labialization	+	+	+

In the Gothic writing system, which was strictly phonemic and rendered each phoneme with one graphic symbol, the combinations of *k* and *h* with a labial element were rendered with characters that were distinct from those for *k*, *h*, and *w*. Similarly, Gothic writing distinguished the phoneme /*hw*/ and the sequence *hw* with different signs. This is grounds for regarding these sounds as single phonemes rather than sequences.⁴

In some languages labialization figures as an independent segmental phoneme, which forms a two-phoneme combination together with the reflex of the velar: thus Greek forms such as *núks*, *kúklos*, *gumnós*, Hittite forms such as *kuenzi*, *kunanzi*,⁵ Toch. A *kum-* (in *kumpäc* 'drum'), *kukäl*, Toch. B *k^wse*, etc.

Finally, in some instances the Indo-European labiovelars are reflected as

4. This property of Gothic can also serve as support for the claim that the Germanic phonological system is archaic.

5. For the earlier stages of Hittite and the other Anatolian languages we must posit a distinct order of labiovelar phonemes which go back to Indo-European labiovelars. This can be seen from stable combinations of velar and labial as in the forms *kuiš* beside *kuiški*, the latter with dissimilative loss of the labial element (cf. Lat. *quisque*). Other evidence comes from individual writings of the labialized sequence *-kw-* as *-uk-*, e.g. *e-uk-zi* (KUB XX 53 V 6, 10) beside the usual *e-ku-zi* (i.e. *ek^w-zi*), etc. For the reflexes of labiovelars in Hittite see also Puhvel 1974.

single labial phonemes, e.g. Greek *b*, *ph*, *p* (respectively from IE **k'o*, **gho*, and **k'ho*). This gives further evidence for the monophonemic nature of the Indo-European labiovelars: the feature of labialization turns into an independent phoneme, which is voiced, voiceless, or aspirated depending on the feature of the velar component in the Indo-European stop but which loses the velar feature.⁶

In terms of transformational rules the rise of labial phonemes from the corresponding labiovelars can be described as in (1):

$$(1) \left[\begin{array}{c} + \text{velar} \\ + \text{labial} \end{array} \right] \Rightarrow [+ \text{labial}] \quad / \quad \left[\begin{array}{c} - \text{syllabic} \\ + \text{stop} \\ \pm \text{voiced} \\ \pm \text{glottalized} \end{array} \right]$$

An analogous change in the Indo-European labiovelars is observed in Italic and, partially, in Celtic. In Italic this development can be seen in the Osco-Umbrian subgroup, in such forms as Osc. *bivus* 'living' (pl.) beside Ir. *beo* 'living', Lat. *uīuus*, Osc. *puí*, *púd*; *pís*, *píd*, Umbr. *pisi* beside Lat. *quis*, *quid*, *quae*, etc.⁷

There are similar outcomes of the development of labiovelars in Celtic on the one hand and in Greek and Osco-Umbrian on the other. They point to different phonological changes in the Celtic consonantism as a whole. The Indo-European velars **ko*/**k'ho*, **go*/**gho*, and **k'o* are reflected in Celtic as **k*, **g*, and **b* respectively:

OIr. *cethir* 'four', Lat. *quattuor*; OIr. *guidiu* 'I ask', Gk. *pothéō* '(I) thirst, solicit'; Mlr. *daig* 'fire' (< **degi*, Pokorny 1959:240), Lat. *foueō* '(I) flame, am ablaze', Skt. *dáhati* 'burns'; OIr. *beo* 'living', Lat. *uīuus* 'alive'; OIr. *ben*

6. The change of Indo-European labiovelars into labials (cf. Gk. *baínō* '(I) go' beside Skt. *gácchati* 'he goes', Goth. *qiman* 'come'; Gk. *boūs* 'bull' beside Skt. *gáu-* 'cow, bull'; Gk. *phónos* 'murder' beside Skt. *hánti* 'strikes, kills'; Gk. *póteros* 'which (of two)', Skt. *katará-* 'which of two') is a relatively late event in the phonological history of Greek. Greek *b*, *ph*, *p* arose from earlier reflexes which yielded the *gʷ*, *kʰw*, *kʷ* still attested in Mycenaean Greek: Myc. *qo-u-ko-ro* beside Gk. *boukóloi* 'herder', *boūs* 'bull'; Myc. *qe-to-ro-* 'four' beside Lat. *quattuor* (see Lejeune 1972, Cowgill 1966:87). The evolution of the Indo-European labiovelars in Greek (except in positions of palatalization) can be represented as the shift of IE **k'o*, **gho*, **k'ho* to Gk. *gʷ*, *kʰw*, *kʷ* to *b*, *ph*, *p*.

7. The same reflex of the voiceless labiovelar **k'ho* as a labial fricative is also found in isolated instances in Germanic: Goth. *fimf* 'five', cf. Lat. *quīnque* < **phenk'hoē*; Skt. *pāñca*. This is not consistent with the regular Germanic reflex; we would expect to find **finhʷ* in Germanic. The final *f* in Germanic 'five' can be explained as due to a specifically Germanic assimilation to the initial phoneme. (This happened adjacent to *n* or *l*, cf. Goth. *aflifnan* 'stay' beside Goth. *leiħvan*: PIE **leik'ho-*.) Therefore there is no justification for tracing these late combinatory changes of Germanic to Proto-Indo-European and thereby denying the existence of labiovelar phonemes in Indo-European (*contra* Klimas 1972:910-12).

'woman', Gk. *gunḗ*, Boeot. *banā* 'woman'; OIr. *bó* 'cow', Skt. *gáuh*; OIr. *bráu* 'millstone', Goth. *-qairnus*, Skt. *grāvan-*.

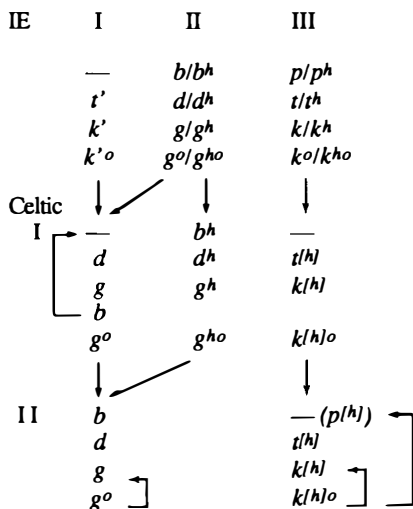
The twofold reflex, whereby IE **k'o* yields a Celtic labial *b* while **gho* and **kho* yield velars *g* and *k* respectively, shows that there were different processes of delabialization of the Indo-European labiovelars in Celtic. Apparently, when Series I was voiced the labiovelar **k'o* did not change first into **go* and then into *b*, as was the case with Greek and Osco-Umbrian, but directly into a labial *b*. The result was a voiced stop series with an unmarked labial member. This voiced series represented a merger of the reflexes of the glottalized Series I and the unaspirated allophones of Series II, which yielded a voiced stop series **b *d *g *go* that must have contrasted with the original aspirated **bh *dh *gh *gho*. These two series subsequently merged (in part due to dialectal deaspiration of the voiced aspirates), and the labiovelars lost the feature of labialization. (In some dialects they shifted to labials, **kho > ph*: Welsh *pedwar* 'four', Gaul. *petuarios* 'fourth' beside OIr. *cethir* 'four', Goth. *fidwōr*: Hamp 1958:211, Watkins 1966:34.)⁸

The facts reviewed here show Indo-European branches with reflexes of the labiovelars that include the feature of labialization or labiality together with clear traces of velar articulation. They can be understood only if we posit original labialized phonemes of the velar order.

2.2.3. *Changes undergone by labiovelars in the daughter dialects. Traces of labialization of velars in Indo-Iranian*

If we posit labiovelars to account for labial reflexes in some daughter languages,

8. The process deriving the Celtic system from Indo-European can be presented as follows:



we must account for their loss in the others. Alternatively, we could reconstruct only one set of plain velars, without labialization, and provide for the secondary appearance of the labial element in one group of dialects (cf. e.g. Kuryłowicz 1935). However, there are both phonological and structural-typological grounds for preferring the reconstruction which includes a labiovelar order for the original Proto-Indo-European system. This approach provides a more realistic account of the historical developments of the daughter languages and is consistent with synchronic and diachronic typological facts. Loss of labialization in one dialect group is easier to explain, from the standpoint of diachronic phonological typology, than a rise of labialization as either feature or phoneme. There is no natural way to explain the appearance of the labial element, while its loss — the loss of an accessory phonological feature modifying the basic velar order — can easily be explained and is fairly widely attested, e.g. in the histories of labiovelars in Dardic and Kafir languages (Ėdel'man 1973) and African languages (Westermann 1949).

It should also be kept in mind that the accessory feature of labialization, as noted above, can also take the form of pharyngealization of a basic dental or velar articulation. This manifestation of labialization in the Indo-European labiovelars can be posited for the branches whose attested reflexes of the labiovelars are plain velars, without labialization.

For these dialects, then, we can posit loss of pharyngealization or labialization and merger of the labiovelar order with the plain velars. But these dialects also formerly had an opposition of labialized or pharyngealized velars to the plain velar order. This is shown in the fact that combinatory palatalization before a front vowel occurs precisely in the labiovelar (or pharyngealized) order and not in the plain velars. This palatalization produces affricates or fricatives:

Arm. *Jer* 'warmth, warm', *Jernum* 'I get warm', *Jerm* 'warm', *Jermn* 'fever', Skt. *hāras-* 'dust', Alb. (Tosk) *zjarr* 'fire', (Geg) *zjarm*, Gk. *théros* 'summer', *thermós* 'warm', *thérma* 'heat': PIE **ghoer-*; cf. Skt. *gharmá-* 'heat', Alb. *gacë* 'smoldering coal', from PIE **ghoor-*, where there is no front vowel to condition palatalization.

Arm. *Jnem* '(I) beat', *gan* 'beating', *ganem* '(I) beat, beat up'; Skt. *hánti* 'beats', pl. *ghnánti*; Avest. *Jainti* 'beats, kills'; Gk. *theínō*; Hitt. *ku-en-zi* 'kills', pl. *ku-na-an-zi*; in these cognates palatalized and unpalatalized forms alternate, depending on the root vocalism.

Skt. *-ca* 'and', Avest. *-ča*; Gk. *-te*; cf. Lat. *-que*, Hitt. *-ki* in *kuiš-ki*, Lat. *quisque*.

Skt. *pāñca* 'five', Avest. *panča*, Alb. *pēsē*, Gk. *pén-te*, cf. Lat. *quīnque*, OIr. *cóic*.

Alb. *n-dez* '(I) kindle', Skt. *dáhati*, Avest. *dažaiti* 'burns'.

Alb. *siëll* 'bring, convey': cf. Gk. *pélomai* '(I) move, strive'.

Arm. *č'ork'* 'four', Skt. *catvāraḥ* (acc. *catúraḥ*) 'four', Avest. *čaθwārō*, Hom. Gk. *téssares* (PIE **kʰoethwor-*), cf. Myc. *qe-to-ro-* (*qe-to-ro-po-pi*).

Alb. *zónjē* 'lady', Skt. *jāni-h*, Avest. *Jaini-*, Pers. *zan* 'woman', Toch. A *šām*, Toch. B *šana* 'woman' (PIE **kʰoen-*); cf. Goth. *qinō*, Gk. *gunē* 'woman'.⁹

In these forms Greek shows dental /d th t/ in place of the expected labial reflexes of the labiovelars, due to secondary combinatory palatalization, comparable to the positional change of labiovelars in the first group of dialects into anterior consonants: Skt. *j* [ʒ], *h*, *c* [č]; Arm. *j*, *č*;¹⁰ Alb. *z z s* (Pedersen 1899, 1904, Ölberg 1976). In contrast, the reflexes of the plain velars **k'* **gh* **kʰ* show no such palatalization in these dialects.¹¹

For Indo-Iranian, palatalization has to have preceded the Proto-Indo-Iranian shift of **e* and **o* to *a*: cf. **-kʰoe* > **-če* > Skt. *-ca* [-ča]. The chronology of palatalization can also be determined from the Aryan forms preserved in Southwest Asian cuneiform documents dated to the mid-second millennium B.C. These documents contain the Aryan word for 'five' in the form *panza* (*pa-an-za*); cf. Skt. *pāñca*. Evidently the palatalization of Indo-European labiovelars had already occurred in Indo-Iranian by the mid-second millennium B.C.

That this group of dialects had a labiovelar order at an early stage of their development can be seen from the reflexes of syllabic sonants following velars that go back to Indo-European labiovelars. The vocalization of syllabic sonants took place relatively recently in Sanskrit, after Sanskrit had separated from Iranian (for Indic-Iranian differences see below). This shows that loss of labialization in those Sanskrit velars that go back to Indo-European labiovelars took place at a relatively recent date.

Evidence for labiovelars in Sanskrit comes from the vocalization of syllabic sonants **ṛ̥*, **ṝ̥*, **ḷ̥*, **ḹ̥* as *ūr*, *ūr̄* after velars continuing a labiovelar (and also after labials); elsewhere — after dentals, plain velars, and palatalized consonants

9. In Indo-Iranian a number of forms show palatalization of velars which go back to unlabialized stops: Skt. *ruk-/ruc-* 'shine', loc. *ruc-é* 'in radiance', *rocáyati*, Avest. *raočayēiti* 'sheds light'. This palatalization is limited to Indo-Iranian and has no correspondences in the other palatalizing languages, for instance Armenian and Albanian. It should be chronologically distinguished from the palatalization which is found in the other branches as well.

10. In a number of Armenian forms there is no palatalization of labiovelars before front vowels, which is explained as a secondary restoration due to analogy (Arm. *kin* 'wife' beside Skt. *jāni-*) or as due to the influence of a sonant (Arm. *hing* 'five' beside Skt. *pāñca*): Kortlandt 1975.

11. The different behavior of plain velars and labiovelars with regard to combinatory palatalization becomes understandable when we look at their correlations with the other accessory order of velars that must be posited on structural-typological grounds. This is discussed below.

— they are vocalized as *īr*, *īr* (see Peeters 1974):

Skt. *pūrṇá-* ‘full’, Lith. *pilnas*: PIE ***ph̥**-**n-**.

Skt. *gūrtá-* ‘desired, welcome’, Lat. *grātus* ‘pleasant, acceptable’, Osc. *brateis*, *bratōm*, **goṛ-t-* (see Burrow 1957): PIE ***k*****oṛ**-**th-**.

Skt. *gurú-* ‘heavy’, Gk. *barús*, Lat. *grauis* from **goṛru-*:¹² PIE ***k*****oṛru-**.

Compare the reflexes *īr* in the following words, reflecting syllabic sonants after plain velars, palatalized velars, and dentals, i.e. after phonemes which had no labial element:

Skt. *īrṇá-*, past ppl. from *táratī* ‘cross over, conquer’, Gk. *trētós* ‘pierced, drilled through’: PIE ***th̥**-.

Skt. *kīrtí-* ‘thought, recollection, glory’, from Skt. *carkartī* ‘proclaim glory’, *kārú-* ‘singer’, Gk. *kēruks* ‘crier, herald’: PIE ***k*****h̥**-**th-**.

Skt. *śīrṣ(á)n-* ‘head’, Gk. *kárā*, cf. Lat. *cerebrum* < **kerasrom* ‘head’: PIE ***k*****h̥**-**s-**.

Skt. *jīrṇá-* ‘old’, Lat. *grānum* ‘grain’, OCS *zrīno*, Gk. *gērōn* ‘old man’: PIE ***k̑*****ṛ**-**n**:¹³ (see Szemerényi 1970:61, Èdel’man 1973:546, n. 14, Steensland 1973:100-101; see Meillet 1937:121 [1938:144-45] for a possible analogous development in Common Slavic).

2.2.4. Reconstruction of the palatalized velar order in Indo-European

The dialect group showing positionally conditioned affricates and fricatives continuing Indo-European labiovelar stops also has fricatives and affricates which do not alternate with plain velars in forms of the same language, but which are cognate to velar stops of the second group of languages. Unlike the fricatives and affricates produced by palatalization, these do not alternate with velars and hence are not historically conditioned by positional environments. This gives them a different phonological status in the system and an origin independent of combinatory conditioning. This order is found in the following Indo-European forms:

Skt. *jānu* ‘knee’, Arm. *cunr* beside Gk. *gónu*, Lat. *genū*, Goth. *kniu*, Hitt. *gi-e-nu*, Toch. A *kanwem*, B *kenine*.

Skt. *ájati* ‘drives, chases’, Avest. *azaiti*, Arm. *acem* ‘(I) lead’ beside Lat. *agō*,

12. For the zero grade of Skt. *gurú-* and Indo-European adjectival formations in *-u-* see also Szemerényi 1976.

13. The form *jūrṇá-* is also attested for the same word (Rigveda I, 46, 3; I, 180, 5; I, 184, 3; etc.). It shows what must be a late variation of *ū* with *ī*, which became possible after the complete disappearance of labialization in the labiovelar reflexes and their merger with the velar stops. There are also isolated cases of *īr* vocalism as a reflex of IE ***ṛ** following a labiovelar; they suggest that the labiovelar may have alternated with the reflex of a plain velar even in the protolanguage: Skt. *gīrṇá-* ‘swallowed up’ from *girāti* ‘swallows’, OCS *žīrq* ‘(I) devour’.

Toch. A *āk-*, Gk. *ágō* '(I) lead'.

Skt. *jánaḥ* 'clan, kin', Arm. *cin* beside Gk. *génos*, Lat. *genus* 'clan, kin'.

Arm. *ayc* 'goat', Avest. *izaēna-* 'made of leather' (i.e. goat skin) beside Gk. *aíks* 'goat'.

Skt. *ágrah* 'field' beside Lat. *ager*, Gk. *agrós*, Goth. *akrs* 'field'.

Skt. *hemantá-h* 'winter', Avest. *zyā*, Arm. *jmeṛn*, Lith. *žiemà*, OCS *zima*, Alb. *dímër* beside Gk. *kheîma*, *kheimón* 'winter', Lat. *hiems* 'winter'.

Skt. *deh-* 'sculpt, anoint, smear', Avest. *daēzayeiti* 'builds a wall around', OPers. *didā-* 'wall', Arm. *dizanem* '(I) put together, pile up' beside Lat. *fingō* '(I) form, shape', Gk. *teîkhos* 'wall'.

Skt. *śrad-* in *śrad-dhā-* 'believe' (Lat. *crēdō*), Arm. *sirt* 'heart', instr. *srtiw*, OCS *srŭdŭce* 'heart', *srēda* 'middle', Lith. *širdis*, Latv. *siņds* 'heart' beside Gk. *kardía*, Lat. *cor*, gen. *cordis*, Hitt. *kir*, gen. *kardiyaš*, Goth. *haírtō*, OHG *herza* 'heart'.

Skt. *śatám* '100', Avest. *satəm*, Lith. *šimtas* beside Lat. *centum*, Gk. *hekatón*, Goth. *hund*, Toch. A *kānt*, B *kante*.

Skt. *śéte* 'rests', *śayā* 'couch', Avest. *saēte* 'lies' beside Gk. *keîtai*, Hitt. *kittari* 'lies'.

Skt. *ś(u)vā* 'dog', gen. *śúnaḥ*, Lith. *šuō*, gen. *šuņs*, Arm. *šun*, gen. *šan* 'dog' beside Gk. *kúōn*, gen. *kunós*, OIr. *cú* 'dog'.

The reflexes are affricates and fricatives in Indo-Iranian, Armenian, Albanian, and Balto-Slavic corresponding to velar stops in Greek, Latin, Hittite, Celtic, and the other languages. It is natural to assume that the phonemes which gave these reflexes must be distinguished from phonemes which yielded velar stop reflexes in both groups of daughter branches.

On typological grounds it can be assumed that these were palatalized velar stops, an accessory order which contrasted with the unmarked plain velar stop order and the labiovelar order to form the following subsystem of posterior stops in Indo-European:

k' gh kh k'o gho kho k̑' ġh k̑h

The palatalized velar order is marked in relation to the velars and tends to change, shifting to compact (posterior) affricates (which are the most stable of the affricates, more stable than diffuse, i.e. anterior, affricates).¹⁴ In some instances the instability manifests itself in merger of the palatalized order with the plain velars. Thus the palatalized order is eliminated from the daughter languages, yielding new orders of affricates and spirants in some and merging with the plain velars in others.

14. For systemic correlations of compact (hushing) and diffuse (hissing) affricates see I. Melikišvili 1976:106-7.

2.2.5. Indo-European root structure and the palatalized velar order

A palatalized velar order which was distinct from the plain velars and labiovelars is also required by internal structural features of the Indo-European

Table 4
Feature matrix for the palatal stops

	\tilde{k}'	\tilde{g}^h	\tilde{k}^h
Syllabicity	—	—	—
Stopness	+	+	+
Voicing	(—)	+	—
Glottalization	+	(—)	—
Velarity	+	+	+
Aspiration	(—)	±	±
Labialization	(—)	(—)	(—)
Palatalization	+	+	+

root canon and the linear ordering of various phoneme types in it. One of the main principles of root structure is rule (1) in 1.3.1 above, to the effect that no two identical phonemes could cooccur in a root (see Benveniste 1935:170-71). This rule can be stated in the more general form of rule 1':

(1') No two stops of the same local order can be combined in a root of the form CVC-.

Rule 1 then becomes a special case of Rule 1'.

Rule 1' provides for the structure of Indo-European roots containing labials, dentals, and labiovelars. No roots of the form C_1VC_2 - are attested where C_1 and C_2 are both labials, both dentals, or both labiovelars.¹⁵ The other posterior

15. The only case where two (identical) labials combine in a single stem is ***phreph-** (Arm. *erewim* '(I) become visible, appear', Gk. *prépō* '(I) stand out, become noticeable', Olf. *richt* 'form', OHG *furben* 'clean': Lewis and Pedersen 1954:54, §31; Pokorny 1959:845); it may be due to combination in a single stem of two morphemes: ***phr-eph-**.

The only form showing two identical consonants in a single root is ***ses-** (Skt. *sás-*, Hitt. *šeš-* 'sleep, rest'), which is not a counterexample to Rule 1' because the identical phonemes are sibilants, not stops: see Mayrhofer 1976:III.449.

stops would be in clear contradiction to this rule if they were treated as belonging to a single point of articulation, since there exist CVC- roots with two posterior stops in Indo-European. Describing the various posterior stops as belonging to different points of articulation brings these roots into conformity with Rule 1'.

This argument for distinct posterior orders within roots follows obviously from structural principles. The exact identity of the phonemes in terms of distinctive features and points of articulation can be determined only by examining their reflexes in the daughter languages. In every reconstructed form with two non-labialized posterior consonants, one is a plain velar (with velar stop reflexes in all daughter languages) and the other is a velar with a coarticulation feature, probably a palatalized velar (with fricatives and affricates as reflexes in the one dialect group and plain velar stops in the other).

It is consistent with what has been said so far that there are no unambiguous examples of Indo-European roots in which both consonants are reflected as plain velars in the daughter languages, and none in which both are palatovelars. Thus we must posit a palatalized velar order and a labiovelar order in addition to the unmodified velar order in Indo-European. Otherwise the following forms would contradict the basic principles of Indo-European root structure:

Osset. *æŋgezun* < Iran. **ham gaizaya* 'wander', WOsset. *ǧizun* 'freeze', Arm. *kc-anem* 'stab' (3sg. aor. *e-kic*), *kc-u* 'bitter', Lith. *gīžti* 'get sour', *gaižūs* 'bitter', *gaižti* 'get bitter', Alb. *gjizë* 'cheese', cf. OIr. *gér* 'spicy, hot, sour': PIE **k'eik̑-*.

Avest. *kasu-* 'small', comp. *kas-yah-*, transf. *kas-išta-*, Lith. *(nu)kašėti* 'weaken' beside Ger. *hager* 'thin, skinny': PIE **k̑hak̑h-*.

Skt. *śaknóti* 'can, is able, helps', Avest. *sačaiti* 'is able, can understand': PIE **k̑hak̑h-*.

Skt. *śākhā* 'branch', Arm. *c'ax*, Lith. *šakà* 'branch', Slav. *soxa* 'stake, shaft', *posoxŭ* 'staff, crook', cf. Goth. *hōha* 'plow' (MÍr. *géc* 'branch'): PIE **k̑hākh-*.

Arm. *jałk* 'branch', Lith. *žalgà* 'long pole', cf. Goth. *galga* 'pole': PIE **ǵhalgh-*.

Skt. *jānghā* 'ankle', Avest. *zanga-* 'leg bone' (of an Ahurian being), *-zangra-* 'leg bone (of daeva)', Lith. *žengiù* '(I) go'; cf. Goth. *gaggan* 'go': PIE **ǵhengh-*.

Skt. *gūhati* 'hides, conceals', Avest. *guz-* 'hide, conceal', OPers. *gaud-* 'conceal', Lith. *gūžė* 'pagan goddess', *gūžti* 'preserve'; cf. OÍcel. *gýgr* 'female giant': PIE **ǵheuǵh-*.

Skt. *śāka-* 'vegetables, herbs', Lith. *šėkas* 'fresh-cut hay as fodder for horses', Latv. *sēks*, OPru. *schokis* 'grass'; cf. OÍcel. *há*: PIE **k̑hēkh-*.

Skt. *kṛśá-* 'emaciated, weak', Avest. *kərəsa-* 'skinny', Lith. *karšėti* 'get old', Czech *krsati* 'get thin'; cf. OÍcel. *horr* 'thinness': PIE **k̑hoȓk̑h-*.

Skt. *sócati* 'shines', *śukrá-* 'white, clean', Avest. *saočint-* 'shining'; cf. Gk.

kúknos 'swan' (from 'white'): PIE ***k̑heukh-**.

Skt. *kákṣā* 'underarm', Avest. *kaša-*; cf. Lat. *coxa* 'thigh', OIr. *coss* 'leg', OHG *hāhsina*, Toch. B *kektseñe* 'body': PIE ***k̑hoḱh-**.

Skt. *śván̄cate* 'opens', Lith. *šùkė* 'notch', Polab. *sacét* 'brush', Russ. *ščet(-ka)* 'brush': PIE ***k̑hwenkh-**.

The principle that no two stops of the same order could cooccur in the same root can be extended with only a few counterexamples to more complex morphological structures, in particular the stem (root + suffix): cf. ***k̑hleī-k̑h-** (Skt. *klīṣṇāti* 'torments', *klīsyate* 'is tormented', Lith. *klīšė* 'claw, nipper', OCS *klěša* 'pincers'); ***ghar-gh-** (Arm. *karcem* 'I am afraid', *karcr* 'hard', Lith. *grāžoti* 'threaten', OCS *groza* 'fear'; cf. Gk. *gorgós* 'terrible', *Gorgō* 'Gorgon'); ***ghn-eu-gh-** (Lith. *gniáužiu* 'I clench fist', OIcel. *knjúkr* 'round mountain-top'), etc.¹⁶

2.3. The *centum* and *satem* languages

2.3.1. Classification of Indo-European stocks based on reflexes of the dorsal stops

Depending on whether the palatovelar order is reflected as affricates and fricatives or as velars (merged with the original plain velars), the Indo-European dialects are usually divided into two large groups: the *satem* and *centum* groups (the terms are the reflexes of the Indo-European numeral '100', ***k̑hm̑thom**). No attested language preserves a palatovelar stop order distinct from the labiovelar and plain velar orders. The palatovelar order, the most marked (or recessive), is unstable and tends to change, merging with the plain velars or shifting to a separate order of affricates or fricatives. This tendency is due to the phonetic instability of the palatovelars, and can be illustrated with data from many attested languages. The shift of palatovelars to affricates and spirants created what are known as *satem* languages, a group further distinguished by loss of labialization and hence by the reduction of the three Indo-European posterior stop orders to a single order of velar stops.

16. As an occasional exception, a suffixal consonant may belong to the same stop order as a root consonant; this is a sort of violation of the principle precluding two consonants of the same order within the stem. An example is ***k̑hn-ekh-**, ***k̑hen-kh-** (Skt. *kāñcate* 'connects', Gk. *kigklis* 'fence', Lat. *cingere* 'belt, bind', Lith. *kinkýti* 'harness') beside ***k̑hen-** 'tighten, squeeze' (Pokorny 1959:558, cf. OIcel. *hnakki*, OHG *hnac* 'nape of neck').

A stem of unclear structure is that of Gk. *gála* 'milk', gen. *gálaktos*, Hom. *glágos* 'milk' (*periglagēs*), Cret. *klágos*, *glakkón*, Lat. *lac*, gen. *lactis* 'milk', cf. also Hitt. *galattar* 'sap'. The word has been proposed to go back to another root: ***m̑l̑k̑-**, cf. Gk. *amélgō* '(I) milk' (Szemerényi 1954).

In the other group of languages the unstable palatovelar order shifts in the opposite direction, losing its palatalization and consequently merging with the plain velars. This creates the *centum* dialect group, which for some time preserved the labiovelars as a distinct phonemic order, contrasting in labialization with the plain velar stops. Only later do the labiovelars in such languages factor out into a sequence of velar stop plus labial phoneme /w/ or merge with the labial stops (see 2.2.2 above).

As they shift, the palatovelars do not change uniformly as a group; rather, the individual consonants undergo different developments, depending on systemic and positional factors. This lack of uniform development can be seen both in the *centum* languages where the palatovelars move toward the plain velar series, and in the *satem* languages where they tend toward affricatization.

2.3.2. *Indo-European dialects with merger of the palatovelar and velar order (centum languages). Positional limitations on the merger*

We first survey the Indo-European dialects in which the palatovelars move toward the plain velars and merge with them into a single velar order. In these languages, the Indo-European labiovelars are preserved as a distinct order. These dialects include the Anatolian languages, Greek, Italic, Celtic, Germanic, and Tocharian. In some of them, however, a number of forms show departures from the basic shift, which can be given a satisfactory structural explanation based on the new correlations that arose among phoneme orders as the system underwent transformation.

In the Anatolian languages (Hittite and Luwian), the palatovelar stops are reflected, as are the plain velars, as velar stops, written with the single and double consonant letters *-k-* and *-kk-*:

Hitt. *gi-e-nu* 'knee', Goth. *kniu*, Gk. *gónu*, Lat. *genū*, Toch. A *kanwem*; cf. Skt. *jānu*, Arm. *cunr*: PIE **ǵʰenu-*.

Hitt. *gimmant-* 'winter', *gi-im-ma-an-za*, Gk. *kheîma* 'winter'; cf. Skt. *hemantá-* 'winter', Arm. *jiwn* 'snow', Alb. *dímër*, Lith. *žiemà*, Latv. *zima*, OPruss. *semo*: PIE **ǵheim-*.

Hitt. *ki-ir* 'heart', gen. *kar-di-aš*, Gk. *khêr*; cf. Skt. *śrad-* (in *śrad-dhā-* 'believe'), Arm. *sirt*: PIE **ǵher-*.

The labiovelars are represented by a sequence of velar plus *u*. In Proto-Anatolian this was clearly a monophonemic segment, i.e. a velar phoneme with a feature of labialization (for the phonological status of these sequences in Hittite see 2.2.2 and note 5 above):

Hitt. *ne-ku-ma-an-za* (Madd., Vs. 51; KUB XIII 4 III 32) 'naked', cf. Goth. *naqaps* 'naked': PIE **ne/okʷo-*.

Hitt. *ku-en-zi* 'kills', pl. *ku-na-an-zi*; cf. Skt. *hánti* 'beats, kills', pl. *ghnánti*, Gk. *theínō* '(I) kill': PIE ***ghoen-**.

Hitt. *šakuwa* 'eyes', *šakuwai-* 'look'; cf. Goth. *saíhvan* 'look', OIr. *ro-sc* 'eye'.

Hitt. *eku-* / *aku-* 'drink': *ekuzzi* (3sg.), *akuanzi* (3pl.), 3pl. pres. *ak-ku-uš-ki-iz-zi* (KUB XIII 4 I 25), 2pl. imper. *ak-ku-uš-ki-it-tin* (KUB XIII 4 II 3); cf. Lat. *aqua* 'water', Goth. *ahva* 'river', OIcel. *æger* 'sea god'.

In the position before *w/u*, the Anatolian reflexes of the palatovelar ***k̥h** appear not as the usual *k* but as *š* (see also Josephson 1979):

Hier. Luw. *sù-wa-nà-i* 'dogs' (Assur b II 15); cf. Skt. *ś(u)vā*, gen. *śúnas*, Arm. *šun*, gen. *šan*, Lith. *šuō*, gen. *šuñs* beside Gk. *kúōn*, gen. *kunós*, Lat. *canis*, OIr. *cú*, gen. *con* 'dog': PIE ***k̥hw(e/o)n-**.

Hier. Luw. *á-sù-wa* 'horse' (Karatepe, 41ff.; corresponds to Phoen. *ss* 'horse' in this bilingual text), *á-sù-wa-i* 'horses', cf. Skt. *ásva-* 'horse', OLith. *ašvā* 'horse' beside Gk. *híppos*, Lat. *equus*, OIr. *ech*, Toch. B *yakwe*: PIE ***eḱhwo-**.

Hier. Luw. *su-wà-há* 'I filled' (Karatepe 38, corresponding to Phoen. *w-ml*); Carchemish A 30 h 2; *su-su-tá*, reduplicated verb, Carchemish A 30 h 1); cuneiform Luw. *šuwa-* 'fill', 3sg. past *šu-u-wa-at-ta* (Laroche 1959a:88); Hitt. *šuwai-* 'fill', Hier. Luw. *suwa-* 'fill'; Hitt. *šunna-* 'fill', Pal. *šun-*; cf. Skt. *śváyati* 'is filled, strengthened', perf. *śū-śuv-uḥ* (with reduplication), Arm. *sun* 'small', Alb. *thëllë* 'deep', OCS *suĭ* 'insignificant, worthless' beside Gk. *kuéō* '(I) am pregnant', *kūma* 'swelling', Lat. *cauus* 'hollow, empty'.

Hitt. *šuwaya-* 'look', cf. OIr. *ci-* 'see'.

This treatment of IE ***k̥h** partly coincides with the reflexes of palatovelars in the *satem* languages. However, the coincidence is only superficial and not the result of identical internal causes. It can be explained as due to the presence of a labiovelar order contrasting in the system with the plain velar order. As the Anatolian palatovelar order was undergoing the *centum* shift toward the plain velars, sequences of velar (former palatovelar) plus *w* would have arisen: [*k'w], [*g'hw], [*k'hw]. These would have fallen together with the reflexes of the labiovelars, **k'o*, **gho*, **kho*, which functioned in the system as marked in opposition to the unmarked plain velars. This merger was prevented by assibilation of the palatal stops before *w/u*, the only place where merger of palatovelars and labiovelars could have occurred. In other positions, the palatovelars shifted normally to velar stops and hence merged with the unmarked velar order.

Thus the double reflex of the palatovelar stops as velars and *s* (before *w/u*) in Anatolian is due to the general tendency for the unstable palatovelar order to shift to the plain velar order which was the most stable of the posterior orders. Merger of the palatovelars with labiovelars was avoided by assibilation of the palatovelar before *w/u*.¹⁷

17. This motivation for the *satem* shift in Anatolian removes the need for regarding these forms as an Aryan borrowing: see Szemerényi 1976.

A comparable development of former palatovelars before *u* can be observed in other *centum* languages. For instance, the unaccountable Latin reflex of PIE **k^hw-* in *canis* 'dog' (see Ernout and Meillet 1967:92; cf. Hier. Luw. *suwana*-above, where analogous factors operated) can easily be explained in terms of the same phonological correlations within the system. In order to avoid merger of the sequence **k^hw-* with the labiovelar reflex **k^ho* > *kw* as the palatovelars shifted to plain velars in Latin, the original sequence was simplified: **k^hw* > *k*.¹⁸

A slightly different development, but due to the same tendency to avoid merger of velars with more marked labiovelars, can be seen in Lat. *equus* 'horse' (PIE **e^hk^hwo-*, cf. Hier. Luw. *asuwa-*, above), *uapor* 'smoke, steam' (PIE **k^hwep^h-*, cf. Lith. *kvāpas* 'smoke', Gk. *kapnós* 'smoke, steam', Skt. *kapi-* 'pleasant odor', see Pisani 1949:40-45), *cāseus* 'cheese' (PIE **k^hwas-*, cf. OCS *kvasŭ* 'kvass, fermented beverage', -*kysnŋti* 'become sour, ferment'). *uapor* and *cāseus* show alteration of the sequence *kw* by loss of one of the components: *k* in *uapor* and *w* in *cāseus*.

The Greek form just cited, *kapnós*, also lacks a labial element: **kwapnós* would be expected (the digamma is missing even in the Mycenaean form, see Lejeune 1958:290, n. 24). The same tendency accounts for the geminate *pp* in Gk. *híppos* 'horse' (with the Indo-European sequence **k^hw*); it is distinct from the Greek reflex of the IE labiovelar **k^ho*, which consistently appears in Greek as a single *p*. (Cf. also the Greek variant *íkkos*, anthroponym *Íkkos*.) Compare the same word in Anatolian, reshaped for analogous reasons.

Lat. *equus* on the one hand, and *uapor* and *cāseus* on the other, can be regarded as having arisen due to the tendency to keep reflexes of the sequence **k^h-w* and reflexes of labiovelars distinct. The result in Latin is phonetically inconsistent reflexes.

It is possible to find other examples of Latin *k* corresponding to *śu* of *satem* languages, which lend themselves to the same kind of interpretation.¹⁹

Despite the variety of results, Anatolian, Latin, and Greek show homogeneous processes as the palatovelars merge with the plain velars in the characteristic *centum* shift. The trajectory of the reshaping of palatovelars in the *centum* languages can be represented as rule (2):

18. The same loss of the labial element in the word for 'dog' is proposed for Germanic **xun-*: see Peeters 1973 (but cf. Hamp 1980).

19. A. A. Zaloznjak (p.c.) considers the same interpretation possible for Lat. *cantāre* 'sing' (a ritual song, cf. *carmen* 'ritual song', *oscen* 'bird used in divination'), and also for Russ. *svjatoj* 'holy, saint', OCS *svetŭ*, Lith. *švėntas*, Avest. *spənta-* 'holy' (Khotanese Saka *ysamaśśandai* < **zam šwantaka* 'holy land', Skt. *pan-* in Ved. *arāmatih pānīyasī*, Avest. *Spənta- Ārmaiti-* 'holy Aramati', Ved. *soma* ... *pānipnatam* 'sacred soma', RV IX, 66, 29, *Soma pānyam-panyam*, Geiger 1916:29, Brunnhofer 1893, Gercenberg 1972:79, 107-8). But cf. the different reflex of **k^hw-* (> *w-*, not *k-*) in Lat. *uitrum* 'glass', Skt. *śvītrá-* 'white'.

$$(2) \quad [+ \text{palatal}] \Rightarrow [- \text{palatal}] / \left[\begin{array}{l} - \text{syllabic} \\ + \text{stop} \\ \pm \text{voiced} \\ \pm \text{glottalized} \\ + \text{velar} \end{array} \right]$$

2.3.3. *Indo-European stocks in which the palatovelar order shifts to affricates or spirants (satem dialects). The diachronic typology of the changes undergone by palatovelars*

The other major group of Indo-European dialects is made up of languages in which the palatalized stop order was removed through a shift to affricates and fricatives. These are the *satem* dialects. In place of the palatalized stops a separate order of affricate and fricative phonemes arises and, together with the inherited sibilant phonemes, forms the general class of affricates and sibilants. These phonemes must have fallen in with the affricates and fricatives which had probably arisen earlier as original labiovelars (or pharyngealized velars) were palatalized before front vowels (see 2.2.3 above). These affricates and spirants arose from labiovelars, not from plain velars. The fact that affricates and sibilants arose from posterior stops under the positional influence of a following front vowel is again to be explained on the basis of systemic correlations among the posterior stop orders.

Given the existence in the system of three posterior stop orders — velar, labiovelar (or labialized velar), and palatalized velar — positionally imposed palatalization could affect only the labialized order, since if velars had undergone palatalization they would have merged with the corresponding palatovelars. Labiovelars in the position before a front vowel appeared in a palatalized form.²⁰ These palatalized labiovelars, which at first were positional variants of the labiovelars, subsequently underwent assibilation and changed into affricates.

The unstable palatalized order is eliminated in the *satem* group, as mentioned above, by phonetic shifting. To judge from the reflexes of palatovelars in the *satem* languages, as well as from general-phonetic typological data, they must have turned into posterior compact (hushing) affricates very early. Compact affricates are articulated at the same place as palatalized stops, but differ from the stops in their greater systemic stability (see Trubetzkoy 1958, Chomsky and Halle 1968). All the reflexes of palatovelars in the *satem* languages can be derived in a phonetically natural way from the original compact affricates that must be posited as the first stage in the transformation of palatovelars in these dialects.

In the *satem* dialects the shift of palatovelars into affricates is also associated

20. The combination of labialization and palatalization is phonetically possible for velars: an example is the Nagasaki dialect of Japanese (Trubetzkoy 1958:127, note 5).

with merger of the labiovelars with the unmarked plain velar stops. These two processes must be regarded together as a single process of eliminating the marked (recessive) orders of posterior stops. Since in the *centum* dialects the marked palatovelar order merged with the unmarked velar order, the other marked posterior order — the labiovelars — preserved its independent phonemic status for some time and only much later, in the individual daughter branches and due to new phonological correlations, was factored out into a sequence of velar plus labial phoneme. In contrast, in the *satem* languages, the marked palatalized order was eliminated by the affrication that turned it into a new unmarked order, and the marked labiovelar order was free to merge with the unmarked plain velars. Thus the shift of labiovelars in the *satem* languages was analogous to the shift of palatovelars in the *centum* languages.

The basic phonetic and phonological differences between the *centum* and *satem* dialects were thus originally determined by the different trajectories of the marked palatovelars, which tended to disappear because they were the most marked of the posterior stops. The shifts of the palatovelars to affricates and the change of the labiovelar order in the *satem* dialects can be represented as Rules (3) and (4):

$$(3) \left\{ \begin{bmatrix} + \text{velar} \\ + \text{palatal} \\ + \text{ejective} \end{bmatrix} \right\} \Rightarrow \begin{bmatrix} + \text{velar} \\ + \text{palatal} \\ - \text{ejective} \end{bmatrix} / \begin{bmatrix} - \text{syllabic} \\ + \text{stop} \\ \pm \text{voiced} \\ \pm \text{glottalized} \end{bmatrix}$$

$$(4) [+ \text{labialized}] \Rightarrow [- \text{labialized}] / \begin{bmatrix} - \text{syllabic} \\ + \text{stop} \\ \pm \text{voiced} \\ \pm \text{glottalized} \end{bmatrix}$$

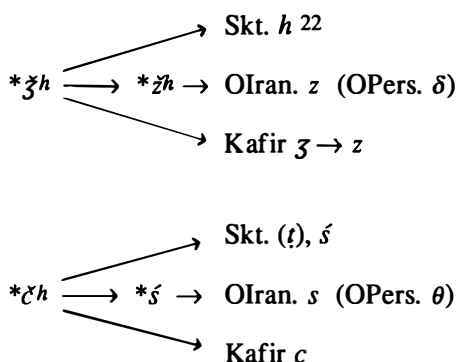
The earliest change in the palatovelars of *satem* dialects was their shift to the corresponding compact (posterior) affricates:

$$*k', *g^h, *k^h \rightarrow *c', *j^h, *c^h$$

In Indo-Iranian these affricates evolve as follows (see Morgenstierne 1945, Ivanov 1958, Èdel'man 1973:543-44):

$$\begin{array}{l} *c' \rightarrow *j^h \begin{array}{l} \nearrow \text{Skt. } j \\ \searrow \text{Kafir } j \rightarrow z \end{array} \\ \quad \quad \quad \rightarrow *j^h \rightarrow \text{OIran. } z \quad (\text{OPers. } \delta) \end{array}$$

For Old Iranian an intermediary stage *ǰ must be posited.²¹



The differences in the phonetic development of Indo-Aryan, Iranian, and Kafir are particularly clear in their reflexes of the Indo-European sequences **ḱhs-* and **khs-*. In Kafir these sequences are reflected respectively as *-c-* [ts] and *-ç-* [tʃ]; in Iranian they are respectively *-š-* and *-xš-*; and in Indo-Aryan they fall together as *-kṣ-* (see Kuiper 1978:101).

In Sanskrit, the voicing of the glottalized affricate **ǰ'* to *ǰ* (for voicing of Series I phonemes and its typological parallels see 1.5.4 above) created a new voiced hushing affricate *ǰ* (= *j*), which favored the spirantization of **ǰh* to *h* and **ǰ'h* to *ś*. Spirantization of affricates is a fairly common phonetic process, consisting in the elimination of the stop component of an affricate. It can be illustrated with data from many languages. In the modern Indo-European languages which have affricates from assimilated stops, the affricates undergo spirantization and yield either compact or diffuse fricatives. For the development of *h* from an affricate, compare the evolution of initial **ǰ'* in Svan: Svan *ham* 'morning' from **ǰ'am*, *hadw* 'wish' from **ǰ'ad-*, and others (Topuria 1960, Gamkrelidze 1968:13). Similar deaffrications of the affricates that must have arisen from the Indo-European palatovelars can be posited for the individual *satem* dialects.

21. If (despite doubts that have been noted: Gershevitch 1965) the Old Persian reflex *δ* (d) was ancient, it would have to be explained as due to deaffrication of an earlier **ǰ*. (A different path of deaffrication of this *j* into *ž* and then *z* is shown in Avestan *z*.) However, deaffrication and loss of compactness, hence shift of hushing fricatives to hissing, is obviously one of the most characteristic features of the Iranian languages; cf. the parallel loss of compactness and deaffrication in Kafir. Typologically analogous means of deaffrication are shown in the shifts of *ǰ* to *d* and *ǰ* to *ž* in the Kartvelian languages Mingrelian and Svan (Gamkrelidze 1968).

22. This *h* in Sanskrit is assumed to have arisen from the affricate *jh* under secondary palatalization before a following front vowel: Skt. *duhitā* 'daughter' < **dujhitā*, cf. Kafir forms Waigali *jū* 'daughter', Ashkun *zū* (see Hamp 1966, 1970b:229); for the Indic form see Manessy-Guitton 1970.

In Armenian, the Indo-European palatalized stops are reflected as the affricates *c*²³ and *ɟ* (Arm. *j*) and the spirant *s*.²⁴ In Armenian the compact affricates that would have been the immediate reflexes of the palatovelars²⁵ shifted to diffuse affricates. This shift could have been favored by the later formation of a compact affricate order *j* [ʒ], *č* by combinatory palatalization of velars before front vowels (for examples see 2.2.3 above). Intervocalic *j* [ʒ] is spirantized to *-z-*: Arm. *dizanem* '(I) collect, put together', cf. Avest. *uz-daēza-* 'embankment', Skt. *dehī* 'embankment'.

In Balto-Slavic the old affricates that replaced the palatovelars underwent deaffrication, first appearing as compact (hushing) *š*, *ž* (their present reflexes in Lithuanian) and then (in Slavic) yielding diffuse (hissing) *s*, *z*. A comparable spirantization of the original affricates evidently took place in the Iranian dialects reflected in Avestan and in a number of East Iranian languages. Evidence for earlier affricates in Slavic can be seen in early Slavic loans into Baltic, e.g. Lith. *stirna* 'roe deer', *tūkstantis* '1000', and others (Trubačev 1973:305ff.). If we assume affricates at an earlier stage, the development of the

23. Cf. Arm. *arcui* 'eagle', Skt. *ṛjipyā-* 'flying straight ahead', epithet of the eagle in the Rigveda; Avest. *arəziyfa-* 'eagle' (cf. OPers. *ārksiphos* [= *ārziphos*] · *aetōs parā Pērsais*), Mod. Pers. *ālūh* 'eagle'; Gk. *Ardūphios*, *Artūbios* (Benveniste 1946:67). The word appears to be native to Armenian, where it goes back to an Indo-European form (see Hübschmann 1897 [1972]:424-25). The phoneme /*c*/, to judge from the Georgian borrowing *arc'ivi* 'eagle', was a glottalized hissing affricate. For the antiquity of the word cf. also the Urartean name of King Rusa's horse *Aršibini* (Melikišvili 1960:204-5).

The opposition of the affricates /*c*/ and /*c'*/, /*č*/ and /*č'*/ in Armenian is traditionally regarded as one of voiceless /*c*, *č*/ to voiceless aspirated /*c'*, *č'*/ (Meillet 1936:24). However, it cannot be regarded as the same type of opposition as, say, Sanskrit /*č*/ vs. /*čh*/. To judge from the reflexes in modern Armenian dialects and from Armenian loans into other Caucasian languages, the differential feature that distinguished the phonemes must have been not aspiration but glottalization: glottalized (and phonetically unaspirated) /*c*/ and /*č*/ were opposed to unglottalized (and phonetically aspirated) /*c'*/ and /*č'*/, as in the non-Indo-European languages of the Caucasus.

On this interpretation of Armenian /*c*/ and /*č*/ as glottalized, it is significant that the assibilated phonemes of Indo-European Series I appear in Armenian specifically as glottalized affricates. In contrast, assibilization of the voiced Series II yields the voiced affricate *j* and assibilization of the voiceless Series III yields the voiceless (unglottalized) affricate *č'*. Thus the glottalization of Indo-European Series I is preserved in its assibilated reflexes in Armenian:

PIE **k̑* > Arm. *c*:

Arm. *cin* 'birth': PIE **k̑*en- (cf. Gk. *génos*, Skt. *jána-* 'clan').

Arm. *cer* 'old; old man': PIE **k̑*er- (cf. Gk. *gérōn*, Skt. *járant-* 'old; old man').

Arm. *cunr* 'knee': PIE **k̑*enu- (cf. Gk. *gónu*, Skt. *jānu* 'knee').

Arm. *acem* '(I) lead': PIE **ak̑*- (cf. Gk. *ágō*, Skt. *ájāmi* '(I) lead').

Arm. *ayc* 'goat': PIE **aiḱ*- (cf. Gk. *álks* 'goat').

24. Occasionally the reflex of IE **k̑*^h in Armenian is *š*, perhaps in the position before *u*: Arm. *šun* 'dog', Gk. *kúōn* (Szemerényi 1964:295).

25. That the original reflexes of the palatovelars in Armenian were compact can be seen from the fact that the Indo-European suffix *-*sḱh-* yields compact *č'* in Armenian: *t'akč'im* '(I) hide', cf. Gk. *ptōskázēin* 'retreat in fear'; *erknč'im* '(I) am afraid', cf. Gk. *dedískomai* id. (Meillet 1936:109).

palatovelars in Slavic coincides completely with their development in the other *satem* languages, and specifically Iranian.

A somewhat different route of deaffrication can be observed in Southwest Iranian, specifically in Old Persian (Morgenstierne 1942, Buddruss 1961), and apparently also in Albanian (Çabei 1972:132). Deaffrication of the palatovelars yields dental stops *d*, *t* in the Iranian dialects, interdental fricatives *θ*, *ð* in Albanian: Alb. *dímēr* 'winter', cf. Skt. *hemantá-*; Alb. *dhēmb* 'tooth', cf. Skt. *jāmbha-* 'tooth, muzzle', Gk. *gómphos* 'peg'; Alb. *báthē* 'fava bean, lima bean', Gk. *phakós* 'lentil'. For typological comparison, combinatorily conditioned deaffrication yields dental stops in Mingrelian and Laz: Mingr. **čxvinž-i* > *čxvind-i* 'nose', **žāčxir-i* > *dačxir-i* 'fire' (Gudava 1964:497ff.).

Sanskrit, where the reflexes of the palatovelars preserve the original phonetics of compact (hushing) affricates, is the most archaic of the Indo-European dialects. Only **čh*, which continues IE **k̑h*, spirantizes to the compact fricative *ś* in Sanskrit. However, even here we have evidence of the earlier affricate in the cerebral *ṭ* which reflects the affricate word-finally: **swek̑h-* > Skt. *ṣaṭ* 'six', cf. the analogous development of **g̑h* in absolute final position: Skt. *váṭ* 'exclamation during sacrifice' (PIE **weḡh-*, Whitney 1889). The affricate is preserved as *c*, although with its compact nature lost, in Kafir: Kati *ačū* 'tear' (cf. Skt. *ásru* 'tear', PIE **ak̑hru*, Hamp 1968:128), Waigali *cāw* 'branch', Skt. *śākhā*.

The old affricate *čh* remains as a relic only in particular combinatory conditions, when preceded by a dental stop or spirant (which in turn undergoes assimilatory affrication):

Indo-Iranian [**sčh*] (from PIE **-sk̑h-*) > Skt. *cch*:

Skt. *gáčchatī* 'goes', Avest. *Jasaiti* 'comes', Gk. *báske* 'go (imper.)', Toch. A *kumnāṣ* 'comes': PIE **k̑o(e)m-sk̑h-*.

Skt. *uccháti* 'shines', Avest. *usaiti* 'shines' (of morning sun), Lith. *aũšti* 'dawn', Hitt. *uškizi* 'looks', Lat. *aurōra* 'dawn'.

Skt. *pr̥ccháti* 'asks', Ved. aor. *á-pr̥cchat*, Avest. *pərəsaiti* 'asks', OPers. *a-p(a)rsam* 'I asked', Arm. *e-harc* (aor.) 'I asked', Lat. *poscō* '(I) demand', Lith. *prašyti*, OCS *prosiiti* 'ask': PIE **ph̑r̥-sk̑h-*.

Skt. *iccháti* 'seeks, wishes', Avest. *isaiti*, Lith. *ieškóti*, OCS *iskati* 'seek', OHG *eiscōn* 'ask, demand'.

Indo-Iranian [**tčh*] (from PIE **-t̑k̑h-*) > Skt. *cch*:

Skt. *úcchalati* 'jumps, bobs' from **ut-sálati*, cf. Skt. *śalabháḥ* 'butterfly, moth', Lith. *šuoľys* 'flight, fleeing', Latv. *suõlis* 'step, gait', MHG *schel* 'jumping, bobbing', Oícel. *skelkr* 'fear'.

Skt. *ucchvan̥káḥ* 'opening' < **utśvan̥ka-*, cf. Skt. *śván̥cate* 'opens'.

In initial position, IE **sk̑h-* is reflected as Skt. *ch-*, i.e. with the old reflex of

the palatovelar preserved and the *s* lost:²⁶

Skt. *chāyā* 'shadow, reflection', Avest. *a-saya-* 'having no shadow', Manich. Sogd. *sy'k* < **sayāka-*, Mod. Pers. *sāya* 'shadow', Baluchi *sāig*, Alb. *hē* 'shadow', cf. Gk. *skiā* 'shadow', Toch. B *skiyo* 'shadow'.

Skt. *chinātti* 'cuts off, pierces', Avest. (*ava-*)*hisiōyāt* 'he would break', Manich. Sogd. 'w-synd- 'tear', Baluchi *sindag* 'split', Mod. Pers. *gu-sistan*, cf. Gk. *skhízō* '(I) tear apart, split', Lat. *scindō* '(I) split'.

Skt. *chidrá-* 'pierced', *chidráṃ* 'hole', Avest. *sidarəm* 'hole', Latv. *šķidrs* 'thin', Gk. *skidarós* 'thin'.

2.3.4. *Positional restrictions on the shift of palatovelars to affricates and spirants in satem languages as evidence for neutralization of the palatalized-nonpalatalized opposition*

The Indo-Iranian, and especially Sanskrit, facts make it possible to determine the earliest distributional patterns for the Indo-European palatovelars, at least in the dialect area which the Indo-Iranian languages continue. There is reason to assume that the palatovelars could appear only in certain positions in the word. The positions in which there was neutralization of the palatalization opposition can be determined with some accuracy. The archiphoneme, as is to be expected, is the unmarked member of the opposition, the nonpalatalized velar stop.

One of the neutralization positions for early Sanskrit was the position before a dental stop; another was the position before *s*. In these positions, palatovelars are not to be expected. This distributional rule means that allomorphs with palatalized and plain velars were in alternation within paradigms. Traces of such alternations can be seen in comparisons within Indo-Iranian and even within Sanskrit itself, where the alternating Indo-European forms are reflected in related morphophonological units showing different reflexes of the ancient velars and palatovelars. Subsequent analogical levelings and generalizations of one of the original allomorphs have effaced the original patterns of alternation, which obscures the original distributional schemas for the Indo-European palatovelars.²⁷

One such alternation appears in the Sanskrit forms *mṛjāti* 'wipes', Avest. *marāzaiti* 'touches, rubs', Khotanese Saka *ni-malys-*, MParth. *n-mrz-* beside Skt.

26. Similarly, Armenian and Celtic preserve the reflex of labial **p^h* after an initial **s-* which subsequently disappears, while in other positions the labial is lost.

27. This view of the distribution of the palatovelars and plain velars in the earliest allomorphs of Indo-European morphemes removes the difficulties that arise when parallel roots with palatovelars and plain velars or voiceless and voiced phonemes are posited. Such artificial forms, with no account of the distribution of the two variants, are frequently found in etymological dictionaries (for such forms see Pokorny 1959:739, 794; Mayrhofer 1963:II.269, 270, and cf. 671); they could be justified by an account of the distributional restrictions on palatovelars in Indo-European root allomorphs.

mṛkṣāti 'rubs': PIE ***m(e)lkʰ-** / ***mlkʰ-s-**.

Skt. *daśasyāti* 'serves, worships', *dāśati* 'worships a god' (cf. Lat. *decet* 'it is fitting, seemly', Gk. *deiknúmenos* 'welcoming') beside Skt. *dákṣati* 'pleases, satisfies': PIE ***tʰekh-** / ***tʰekh-s-**.

Skt. *piṁśāti* 'decorates', *péśa-* 'form, color', cf. Avest. *paēs-* 'color, dye', *paēsa-* 'decoration', Lith. *piěšti* 'write', OCS *pīsati*, Russ. *pisat'* 'write' beside Skt. *pinkte* 'dyes, paints': PIE ***phinkh-** / ***phinkhth-**.

Skt. *sáhate* 'defeats', *sáhas-* 'victory, power', beside *sakṣa-* 'victor', cf. Gk. *Héktōr*: PIE ***segh-** / ***segh-s-**.

Skt. *váhati* 'conveys, rides' (cf. Avest. *vazaiti*, Lat. *uehō* '(I) convey', Goth. *ga-wigan* 'move, shake') beside Skt. *ávākṣam* (aor.): PIE ***wegh-** / ***wogh-s-** > ***woks-**.

Skt. *deh-* 'anoint, smear' (cf. Arm. *dizanem* '(I) put together', Lat. *fungō* '(I) mold, form') beside Skt. *degdhi* 'anoints' (3sg.), *digdhá-* (pass. ppl.): PIE [***deigh-**] / [***d(e)ig-th-**] > [***d(e)ig-dh-**].

Skt. *múhyati* 'errs, gets lost', Khotanese Saka *mūysamḍai* 'stupid' (Bailey 1961:79) beside Vedic *mugdhá-* 'having made a mistake': PIE [***muigh-** / ***muightho-**] > *mugdhá-*. Parallel to this form we find a later (judging from its attestation) *mūḍhá-*, with loss of the first consonant of the cluster.

In Indo-Iranian, at morpheme boundaries where an old affricate continuing an Indo-European palatovelar combined with a following dental stop, contact sequences arose which underwent a number of subsequent phonological changes. In particular, when a verbal morpheme ending in the reflex of a palatovelar (i.e. possibly an affricate or spirant) combined with a morpheme beginning with **-th-*, the result was a sequence with either a voiced *-dh-* or voiceless *-t-* depending on the treatment of Indo-European Series II phonemes. Thus PIE ***liġ-tho-**²⁸ and ***seġ-tho-**²⁹ are regularly reflected in Indo-Iranian as **liġdha-* and **seġdha-*. Then the first consonant is lost, with compensatory lengthening of the preceding vowel and the feature of posteriority transferred to the following dental stop. The result is the Sanskrit forms *līdhá-*, *sādhá-*, with a retroflex (cerebral) *ḍh* whose retroflex feature represents the posteriority³⁰ of the former preceding affricate (see Szemerényi 1970:95). This obviously provided one of the sources of retroflex (cerebral) phonemes in Sanskrit.

The forms having regular reflexes of a velar before a stop must be the older ones and consistent with the distributional pattern for palatalized forms in Indo-

28. PIE ***leiġh-** 'lick', Skt. *lihati* 'licks', Gk. *leíkhō*, Arm. *lizum*, Lat. *lingō*, Goth. *bilaigōn* 'lick', OHG *lecchōn*, Lith. *liežiù*, OCS *lizati*, cf. Skt. *līdhá-* 'licked' (ppl.).

29. PIE ***seġh-** 'conquer', Skt. *sáhate*, cf. Gk. *ékhetai* 'persists', Myc. *e-ke*; cf. Hom. *Héktōr*, Skt. *sādhá-* 'defeated' (ppl.).

30. For the retroflex forms of Sanskrit as compact ([-anterior]) see A. M. Zwicky's dissertation, referred to by Chomsky and Halle 1968:312; they also refer to Whitney 1889.

European root allomorphs. The individual forms showing assibilated palatovelars in this position must indicate later paradigmatic leveling (e.g. *mṛṣṭá-* beside *mṛjāti* ‘rubs, wipes’, *diṣṭá-* beside *diś-* ‘indicate’ instead of **dikta-*, etc.). Alternatively, they may indicate fluctuation in the protolanguage between palatovelars and plain velars before dental stops (in contrast to consistent nonpalatalized treatment before *-s*).

Evidence for the allomorphic pattern and for positions of neutralization where only plain velars are found also comes from Balto-Slavic. Here the original palatalized phonemes are reflected, as in other *satem* languages, as fricatives: *š, ž* in Lithuanian, *s, z* in other Baltic languages and in Slavic (for examples see 2.2.4 above). These spirants would have arisen from the affricates that must have been the first reflexes of the original palatovelar stops. One position of neutralization in Balto-Slavic is before *r* and *l* (and possibly other sonants); another is the position after *s*. That these were contexts of neutralization is shown by the reflexes of posterior stops in such positions in the daughter languages. Despite subsequent analogical changes which have obscured the original distributional patterns, ‘exceptions’ to the regular treatment of palatovelars can be seen as reflecting regular allomorphic alternations in Indo-European. The following Balto-Slavic forms illustrate this.

Lith. *smākras*, *smakrà* ‘chin’, Latv. *smakrs* ‘chin’ beside Skt. *śmāsru-* ‘chin’, Arm. *mawruk’*, *moruk’* ‘beard’, Alb. *mjékër* ‘beard’, Hitt. *zamankur* ‘beard’,³¹ OIr. *smech* ‘chin’: PIE **smekh-r-* / **smek̑h-r-*.

OCS *svekry* ‘mother-in-law (husband’s mother)’ beside Lith. *šėšuras* ‘father-in-law (husband’s father)’, Skt. *śvāšura-* ‘father-in-law’, Arm. *skesur* ‘mother-in-law’, Gk. *hekurá* ‘mother-in-law’, Goth. *swaihrō*: PIE **swek̑bru-* / **swek̑huro-* (see Szemerényi 1964:291ff.).

Latv. *kreĶls* ‘shirt’ beside Ukr. *kresnuti* ‘strike’, Serbo-Cr. *krēsati* ‘chop, cut down or apart’, OE *hrægl* ‘clothing’, OIcel. *hræll* ‘pole for fastening fabric on loom’: PIE **khrek̑h-l-* / **khrek̑h-*.

Lith. *klausyti* ‘listen’, Latv. *klāusīt*, OPruss. *klausīton* ‘listen’ beside Lith. *šlovė* ‘fame’ (Fraenkel 1962-1965:II.1008), cf. OCS *sløvq*, *sluti* ‘be reputed, known’, *slušati*, Russ. *slušať* ‘listen’: PIE **khleu-s-* / **k̑hleu-s-*.

Slav. **gqsī*, Russ. *gus’*, Pol. *gęś*, Slovene *gōs* beside Lith. *žqsis* ‘goose’, Latv. *zūoss*, OPruss. *sansy*, Gk. *khēn*, Skt. *hamsá-h*, Lat. *ānser* ‘goose’: PIE **gh̑ns-* / **gh̑hon-s-*.

Lith. *akmuō*, *akmueñs* ‘stone’, OCS *kamy* ‘stone’ beside Lith. *ašmuō* ‘point, spike’, *āšmens* (pl.), Skt. *áśman-* ‘stone’: PIE **akh̑men-* / **ak̑h̑men-*; cf. Lith. *ašrūs*, *aštrūs*, OCS *ostrū* ‘sharp’, Lat. *ācer* ‘sharp’: PIE **ak̑her-*.

Lith. *ieškóti* ‘seek’, OCS *iskati*, Russ. *iskat’* beside Skt. *iccháti* ‘wishes’, OHG

31. Hitt. *zamankur* must be derived by metathesis from **z(a)-mankru*, unlike Hier. Luw. *surna-* ‘horn’ (cf. Hitt. *karawar* ‘horn’), where the regular assibilation of **k̑h* took place before the *u* which arose relatively early due to vocalization of a syllabic sonant.

eiscōn 'wish': PIE *ei-skʰ- / *ei-skʰh-.

Latv. *šķidrs* 'thin', Lith. *skiedrà* 'chip, sliver' beside Gk. *skidarós* 'thin, rare', Avest. *sidarəm* 'hole', Skt. *chidrā-* 'pierced': PIE *skʰeit'- / *skʰheit'-.

Analogous evidence for neutralization before a sonant can be found in Albanian and Armenian. The ancient allomorphic distribution can be seen in forms with posterior stops in these languages:

Alb. *glū-ri* 'knee' (Geg), *gju-ri* (Tosk) 'knee', cf. OIr. *glún* 'knee' beside Skt. *-jñu-*, Gk. *gnu-*: PIE *kʰnu-n- / *kʰlu-n-.

Alb. (Geg) *krýe*, (Tosk) *kríe*, pl. *krérë* 'head', cf. Skt. *śíras-* 'head', Oícel. *hjarni* 'brain', Lat. *cerebrum* 'skull', Gk. *kárā* 'head', Hom. *kárēna* 'heads': PIE *kʰr- / *kʰh(e)r-.

Alb. *ka* 'bull', pl. *qe* (from **krā*: Hamp 1957, 1960), Lith. *kárvė* 'cow', OPol. *karw*, Pol. *krowa*, Russ. *korova*, OPruss. *sirwis* 'roe deer', Lat. *ceruus* 'deer': PIE *kʰr̥w- / *kʰherw-.

Alb. *mjékër* 'chin', Arm. *mawruk* 'beard', Lith. *smākras* 'beard, chin', cf. Skt. *śmáśru-* 'beard': PIE *smekʰr- / *smekʰh-.

To judge from these examples, neutralization of the palatovelar–plain velar opposition before sonants, and especially before *r, was characteristic not just of individual Indo-European dialects but of a whole dialect area including at least Balto-Slavic, Albanian, and Armenian.

Of course there may have been other contexts for neutralization of palatalization, for which all evidence has been lost in the daughter languages. There may even have been positions where there was neutralization throughout all of Indo-European, positions in which no evidence of the opposition of palatovelar to plain velar can now be found.

Since there are positions where the opposition of palatovelars to plain velars is neutralized and only the plain velars occur, the overall distribution of the palatovelars is narrower and more restricted than that of the velars. This is fully consistent with the unmarked nature of the velars relative to the palatovelars. But this narrower distribution is not grounds for denying the existence of the palatovelar order in the Proto-Indo-European phonological system. The palatovelar and labiovelar orders of Indo-European were marked relative to the unmarked velar order, and the three orders together formed the subclass of posterior phonemes.

There are, however, in *satem* languages such as Armenian, instances of neutralization where the palatovelar member appears, rather than the plain velar. One such context of neutralization is the position following *u, where the Armenian reflexes indicate that only the palatovelar member of the opposition could occur:

Arm. *usanim* 'I study' beside OCS *ukŭ* 'student; science', Lith. *jaukùs*

‘accustomed to people’, Skt. *ókas-* ‘house; accustomed place’, OIr. *to-ucc-* ‘understand’, Goth. *bi-ūhts* ‘accustomed’, etc.

Arm. *loys* ‘light’, with a development analogous to Skt. *rúśant-* ‘shining’ beside Skt. *roká-* ‘light’, Lith. *laukas* ‘with a white spot on the forehead’ (Meillet 1936:37).

Arm. **boyc* ‘food’ beside Skt. *bhógaḥ* ‘enjoyment’, *bhuñkté* ‘enjoys’, Alb. *bungë* ‘oak (with edible acorns)’ (Pokorny 1959:153).

Arm. *dustr* ‘daughter’ beside Lith. *duktė* (the Armenian *s* and the Lithuanian *k* both reflect assimilatory devoicing before the following *t*), Skt. *duhitā́*, Avest. *duyḡdar-*, Goth. *daúhtar* ‘daughter’ (Winter 1965:104-5, 112-13, Hamp 1970b:229-31).

There is evidence of a comparable neutralization in Sanskrit and possibly Kafir, e.g. Skt. *rúśant-* ‘shining’ with palatal *ś* after *u*; Prasun *lūšt* ‘daughter’ (Morgenstierne 1949:208). This suggests that the process is distinctly old in the *satem* languages.

This neutralization produced a shift of **-uḱh* to *-us* in Armenian. There must be some systemic connection between that shift and the fact that we also find the reverse process, where **us* yields *uk*: Arm. *mukn* ‘mouse’ beside Skt. *mūṣ-*, OCS *myšĭ*, Gk. *mūs*, Lat. *mūs*; Arm. *jukn* ‘fish’ beside Gk. *ikhthús* ‘fish’; etc. The two processes of palatalization (which brought affricates and new spirants into the system) and conditioned changes in original spirants (discussed below) must have been mutually interconnected.

2.3.5. *The centum and satem dialects of Indo-European viewed as the result of shifting of the palatovelars in different phonetic directions*

Above we have surveyed *centum*-like reflexes of Indo-European palatovelars in *satem* languages. What these reflexes attest to is not a secondary, recent origin of the palatovelars from plain velars through positional palatalization (see Georgiev 1958; for the history of the question see Szemerényi 1972:128-29), but rather contexts of neutralization in which, at least in dialectal Proto-Indo-European, only velars could occur. This led to morphophonological alternations of palatalized and unpalatalized consonants in the allomorphs of Indo-European morphemes. The alternation is reflected in the *satem* languages in forms containing velars instead of palatovelar reflexes. If there is any sense in which the palatovelars or the velars are secondary, it is a purely functional one: we can speak of the lesser functional role of the palatovelar order in comparison to the velars, or their marked nature and phonetic instability in the system.

From what has been said so far it follows that the Indo-European dialects can be divided into two major groups depending on their reflexes of the palatovelar order that was eliminated from the Indo-European phonological system. Those

dialects which eliminate the palatovelars by merging them with the unmarked velars comprise the *centum* dialect group; those in which the palatovelars are eliminated by shifting them to affricates or spirants comprise the *satem* languages. However, *centum* languages can have instances of *satem* reflexes of palatovelars (e.g. the reflex of IE **kh* as *s* in Hittite), and *satem* languages have instances of *centum* reflexes. These are due to structural factors in the morpho-phonemic alternations of the Proto-Indo-European dialects.

This interpretation of the correlations between the *centum* and *satem* languages is in some respects consistent with the traditional division of the Indo-European dialects into two major groups based on their reflexes of the palatovelars. The subsequently discovered departures from the regular reflexes, which have been taken as grounds for reexamining the binary classification of the dialects, prove to be due to ancient structural correlations and can be derived from regular developments of the Indo-European system if we assume that there were two major directions in the transformation of the palatovelar stops. It is these two directions that are responsible for the traditional classification into two basic dialect types, *centum* and *satem*.

In traditional Indo-European studies, the presence of all three orders of dorsal stops — plain, labialized, and palatalized — has been denied on the grounds that no attested daughter language distinguishes all three orders. But this is not a valid argument against reconstructing the three orders for Proto-Indo-European. It is methodologically incorrect for contemporary diachronic linguistics: for some structure to be reconstructed, it is not necessary that the identical structure be found in one of the daughter languages that directly continue the original system. It would preclude reconstructing typologically plausible structures (i.e. structures that can be verified on the basis of cross-linguistic data) that are reflected in all daughter languages in a transformed shape.

That the three dorsal stop orders posited for Indo-European are possible in principle is demonstrated by typological considerations and confirmed by data from non-Indo-European languages: Abkhaz, mentioned above, and several North American Indian languages (see Kinkade 1963). Further support comes from modern Indo-Iranian languages with secondary systems of three dorsal stop orders (for Yazgulyam see Èdel'man 1973):

$$\begin{array}{c} k \text{ — } k' \text{ — } ko \\ g \text{ — } g' \text{ — } go \end{array}$$

The full system of late Proto-Indo-European stops, from the period just before the breakup into independent dialects, is shown in Table 5.

Table 5
The late Proto-Indo-European stop system

(p')	bh	ph						
t'	dh	th						
k'	gh	kh	k'o	gho	kho	k̑	ġh	k̑h

2.4. The Indo-European system of sibilants

2.4.1. The sibilant /s/

The change of the palatalized stops into affricates and spirants in *satem* languages created a set of phonemes which joined the inherited Indo-European spirant system to form a new subclass of sibilant phonemes, comprising spirants and affricates. The sibilant phoneme system of Indo-European is traditionally reconstructed as a single sibilant *s, defined by the following correspondences:

Skt. *sādayati* 'seats, plants', Arm. *nstim* '(I) sit down', Gk. *hézomai* '(I) sit down', Lat. *sedeō* '(I) sit', Goth. *satjan*, Lith. *sédėti* 'sit': PIE *set'-.

Skt. *sal-ilá-* 'sea' ('salty'), Arm. *ał* 'salt', Gk. *hális*, Lat. *sāl*, gen. *salis*, OCS *solī* 'salt': PIE *sal-.

Skt. *ásrk*, gen. *asnáh* 'blood', Gk. (poet.) *éar*, OLat. *aser*, *asser* 'blood', Latv. *asins*, Toch. A *ysār*, Hitt. *e-eš-har* 'blood': PIE *esH(o)r-.

Skt. *ásmi* 'am', *ásti* 'is', Lat. *sum*, *est*, Gk. *estí*, Goth. *ist*, OLith. *esmi*, OCS *jestī*, Toch. B *ste*, Hitt. *e-eš-mi*, *e-eš-zi*: PIE *es-mi, *es-thi.

Nom. sg. Avest. *čiš* 'which, who', Gk. *tís*, Hitt. *kuiš*, Lat. *quis*: PIE *khois.

Before *w*, IE *s is normally reflected as *s*:

Skt. *svápnah* 'sleep', *svápiti*, pass. *supyate* 'sleeps', ppl. *suptá-* 'having fallen asleep', Avest. *xvap-* 'sleep', Gk. *húpar* 'daydream', Lat. *sōpiō* '(I) fall asleep', *sopor* 'sleep', Alb. *gjumē*, OCS *sūnū* 'sleep', Hitt. *šuppariya-* 'sleep', Toch. A *špām*, B *špane* 'sleep': PIE *sweph- / *suph-.

Skt. **svarati* 'dawns, casts light', Gk. *heilē* 'warmth of sun', Lith. *svilinti* 'sing' beside Skt. *súvar-*, Avest. *hvar-*, Gk. *ēlios*, Goth. *sauil*, Lith. *saulė* 'sun': PIE *swel- / *sāwel- (but see Fraenkel 1962-1965:II.954).

Skt. *svidyati* 'sweats', Avest. *xvaēda-* 'sweat', Gk. *hidrōs* 'sweat', Alb. *djērsē* 'sweat', Lat. *sūdor*, OE *swāt* 'sweat': PIE *sweīt'-.

Skt. *svādú-* 'sweet', Gk. *hēdús*, Lat. *suāuis*, OE *swēte* 'sweet': PIE *swāt'-.

Reflexes of initial *s- before *n:

Skt. *sneha-* (Prakrit *siṇha-*) 'snow' (Pokorny 1959:974), Avest. *naēža-* 'fall (of snow)', Gk. *nípha* (acc.), Lat. *nix*, gen. *niuis* 'snow', OIr. *snigid* '(it) drips, rains', OHG *snīwan* 'fall (of snow)', Goth. *snaiws* 'snow', Lith. *sniėgas*, OCS *sněgŭ*, Russ. *sneg* 'snow'.

Skt. *snuṣā*, OIcel. *snor*, Gk. *nuós*, Arm. *nu*, Slav. *snŭxa* 'bride, daughter-in-law'.

*s is reflected analogously in initial position before an obstruent: *sph-:

Skt. *sphāyate* 'gets fat, ripens', Lith. *spėti* 'have time, be on time', OCS *spějŭ* '(I) ripen', Lat. *spatium* 'breadth, space', OE *spōwan* 'bloom', Hitt. *išpai-* 'become satiated'.

Skt. *sphūrjati*, *sphūrjáyati* 'is manifested, becomes apparent', Gk. *spharagéomai* '(I) hiss, crackle', Lith. *sprāga* 'crackle', caus. *sprāginti*, Alb. *shpreh* 'express', OE *sprecan* 'speak'.

*skh-:

Skt. *skabhnāti* 'leans', Avest. *upa-skambəm*, Sogd. *šk'np-* (*skamb), Lat. *scamnum* (< *scabnum) 'bench'.

Skt. *skhálate* 'stumbles, vacillates', OArm. *sxalem* '(I) stumble'.

*sth-:

Skt. *tīṣṭhati*, Avest. *hištaiti*, Gk. *hístēmi*, Lat. *sistō*, *stō* 'place', 'stand'.

Skt. *stighnoti* 'lifts up', Gk. *steíkhō* '(I) go', Goth. *steigan*, Alb. *shtek* 'path', OHG *steg*, Latv. *staiga*.

Skt. *sthālam* 'high place', Gk. *stéllō* '(I) build, draw up', OLat. *stlocus*, Lat. *locus* 'place', OIcel. *stallr* 'stopping place, stall', OPruss. *stallū* 'stand'.

Skt. *starī*³² 'barren cow', Arm. *sterj* 'infertile (of animals)', Gk. *steíra* 'infertile', Alb. *shjerrē* 'young female calf', Lat. *sterilis*, Goth. *stairō* 'infertile'.

For a number of dialect areas, a voiced [*z] must be reconstructed as a positional variant of *s found before voiced stops:

PIE *(e)s- + *-dhi > Skt. *(a)z-dhi > *edhí*, imper. sg. 'be', cf. Avest. *zdī* 'be' (beside Gk. *ísthi*).

PIE *ni- + *-st'-os 'nest, residence' > Skt. *nizda > *nīḍá-* 'haven', Lat. *nīdus*, Lith. *lizdas*, OCS *gnězdo* 'nest' (cf. OE *nest*, Arm. *nist* 'residence', *nstim* '(I) sit, sit down'): PIE *set'- / *st'-. Derived from the same root is Gk. *ózos* 'branch' (< *ozdos), cf. Arm. *ost*, Goth. *asts* 'branch'.

In these forms, *s could undergo positional voicing only after the glottalized phonemes were voiced (as is shown by forms from dialects where Series I is preserved as voiceless). This voiced variant reflects not the Proto-Indo-European situation but the dialectal existence of voiced allophones.

Only in a few sequences do we have voiced variants of IE *s adjacent to a consonant of the voiced Series II. This is found only in positions which are not

32. The absence of aspiration in *th can be explained as due to the distributional rule for aspirated allophones in the stem and devoicing after s- by Siebs' Law.

affected by the devoicing of Siebs' Law. Since in initial sequences of *s plus voiced (aspirate) the stop component is devoiced by Siebs' Law, and since a preceding voiced consonant is always devoiced before *s, voicing of *-s- could take place only in certain combinations in word-medial position. An example, of Indo-European date, is Skt. *edhí* < *(a)zdhi mentioned above, which may go back to PIE [*zdhi] 'be' (imper.), cf. Avest. *zdī*.³³

It is entirely possible that a voiced variant [-z-] could sometimes appear in intervocalic position, although cognate sets with intervocalic /s/ give no direct evidence of such voicing: cf. **swesor*-, Skt. *svásar*- 'sister', Avest. *xvaŋhar*-, Goth. *swistar*, Lith. *sesuō*, Russ. *sestra* beside Lat. *soror* 'sister' (with later voicing and rhotacism, *s* > *z* > *r*: see Tronskij 1960:121).

2.4.2. Comparative-historical evidence for positing a separate class of sibilant spirants. The compact fricative /*s/

In addition to the cognate sets with *s* in the daughter languages on the basis of which /*s/ must be reconstructed for Proto-Indo-European, we find — in the same dialects and in the same positional contexts — another set of correspondences which presuppose that Indo-European had another, phonemically distinct sibilant. This phoneme is established by the following correspondences:

Skt. *pásyati* 'sees', cf. Avest. *pašna*- 'glance, view' : Gk. *sképtomai* '(I) look' (*skep*- < **spek*-), Lat. *speciō* '(I) look, see', OHG *spehōn* 'regard', Oícel. *spá* 'prediction, prophesy'. Sanskrit has -*sp*- in medial position: Vedic perf. *paspasé*, aor. *áspas̥ta*, pass. ppl. *ánuspas̥taḥ*; this gives rise to forms with initial *s*- such as *spásati* 'sees', *spát* 'observer'.

Skt. *tejate* 'becomes sharp', *tejáyati* 'sharpen', Avest. *taēža*- 'point, spike' : Gk. *stízō* '(I) stab', Lat. *in-stigare* 'instigate, incite', Goth. *stiks* 'sticking, stab', OHG *sticken* 'stick, stab'.

Skt. *tūmpati* 'harms', *tumpāti*, *tupāti*, *tópati* : Gk. *túptō* '(I) strike', *stúpos* 'pole, stick', *stupázei* · *ōtheí* (Hesychius), *stuphelízō* '(I) beat off, strike', Lat. *stuprum* 'shame'. In medial position Sanskrit has -*st*-: *pra-stumpāti* 'pushes with the horns'.

Skt. *kalá* 'lesser part' : Arm. *čətk'em* '(I) stab, break', Gk. *skállō* '(I) dig', Goth. *skilja* 'butcher', Lith. *skeliū* '(I) split', OCS *skala* 'cliff', Hitt. *iškallai*- 'tear, cut'.

Skt. *kirāti* 'pours out, throws' : Gk. *skairō* '(I) jump, dance', OHG *scerōn* 'be courageous'. (In medial position Sanskrit has -*sk*-: *apaskaraḥ* 'defecation':

33. The fact that Indo-European had a phoneme *s without a voiced correspondent *z groups it with many languages which have /s/ but no /z/; *s* is the unmarked member of the *s*~*z* opposition. There are only a few languages in the world which lack a phoneme *s*. Together with *p*, *t*, *k*, *n*, the phoneme *s* forms a minimal phonemic inventory: Trubetzkoy 1958, Jakobson 1971a, Milewski 1967, Chomsky and Halle 1968:413.

Mayrhofer 1956:I.38.)

Skt. *kṛdhū-* 'shortened, small', comp. *kradhīyams-*, superl. *kradhiṣṭhaḥ* : Gk. *skurthálios* · *neanískos* (Hesychius); *skúrthaks* · *meíraks* (Hesychius). In medial position: Skt. *á-skṛdhoyuh* 'unshortened', cf. ORuss. *osk''rd''* 'axe'.

These forms have no initial spirant in Sanskrit but initial *s elsewhere in Indo-European. They contrast with the cognate sets adduced earlier, where initial s- is reflected as a sibilant in all the Indo-European stocks.³⁴ The double reflex of Sanskrit can point only to an original phonemic distinction in Indo-European.³⁵ The fricative reflected as initial s- in all the dialects can be identified as a voiceless diffuse spirant /s/. It is reflected as a hissing spirant [s] in other positions as well. The other phoneme, reflected as zero in Sanskrit and generally as s- elsewhere, can be defined as a compact fricative /*s/, opposed to the diffuse /s/ and to be regarded as its palatalized correlate.

This phonological interpretation is justified by typological considerations concerning the systemic correlations of sibilant spirants, as well as by the fact that there was a palatalization correlation among the posterior stops. If we assume the second phoneme was palatalized in Indo-European, then we have a satisfactory explanation for the Armenian and Sanskrit reflexes of the sequence *-skh- discussed above: Skt. *chyáti* 'cuts, cuts off', Avest. *fra-sānəm* 'destruction', Gk. *skháō* '(I) divide into layers', Lat. *sciō* '(I) distinguish, know'; Skt. *chāyā* 'shadow', Gk. *skiā* 'shadow', Toch. B *skiyo*; Skt. *gácchati* 'goes', Gk. *báske* 'go (imper.)'; Skt. *uccháti* 'flares up', Lith. *aũšti* 'be light, dawn' (see above); Arm. *erknč'im* '(I) am afraid', Gk. *dedískomai* 'I avoid, am wary, afraid'. The affricate *ch* and the sequence *cch* of the Sanskrit forms can easily be explained as due to changes in the cluster *skh in initial and medial positions. Initial *skh regularly yields *ch due to affrication of the palatal *kh and loss of the preceding sibilant. This is consistent with the reflexes of initial *sph as *ph* and *skh as *kh* (see examples at the beginning of this section).

In Armenian, the sequence *-skh yields the compact affricate č', while *kh yields the diffuse affricate c' (due to the shift of *č' to c' discussed in 2.3.3 above). Evidently *š hindered the development of compact *č (from *kh) into diffuse c: in Armenian *skh yields č', and in Sanskrit the otherwise regular shift

34. The missing initial spirant of Sanskrit does appear in medial position following a vowel when it is no longer initial due to paradigmatic alternations in derived forms. Synchronically, we can speak of an alternation of s and Ø in such forms, a morphophonological alternation within derivational or inflectional paradigms of Sanskrit. The forms with this alternation regularly show unaspirated voiceless stops in initial position, while those not having the alternation (i.e. those lacking an initial spirant in comparison to their cognates) show initial voiceless aspirates. This is probably due to differences in the development of Indo-European voiceless aspirates after a fricative in Sanskrit.

35. A typological parallel is the development of initial *sp- in Celtic and Armenian, where s- can disappear while a reflex of the following *ph is preserved (Celt. *f* < *sp-, Arm. *p'* < *sp-) despite the fact that *-p- is completely lost in other positions (see I.1.5.2 above).

of *ch* to *ś* does not occur after **ṣ*.³⁶ The position before **ḥ* was evidently one in which the opposition of **s* and **ṣ* was neutralized in Indo-European; only **ṣ* could occur there. (However, both sibilants could occur before plain velar **kh*.)

An illustration of the behavior of /**ṣ**/ in initial position is provided by the formally and semantically related Indo-European words Skt. *ákṣi* 'eye', Avest. *aši*, Arm. *akn*, Gk. *ósse*, Lat. *oculus*, Lith. *akis*, OCS *oko*, Slav. **okn*- 'spring', Toch. A *ak*, B *ek* beside Hitt. *ṣakuwa* 'eyes', *ṣakuwai*- 'see', *ṣakuni*- 'spring', Goth. *sáihvan* 'see', OIr. *rosc* 'eye'. This set shows initial zero in one group of dialects (including Sanskrit; cf. the development of **ṣ* before a consonant in Sanskrit) and *s*- in the other. This interpretation of these forms confirms the etymological connection proposed earlier (Schmitt-Brandt 1967:63), but without requiring reconstruction of an initial laryngeal. Comparable correspondences occur in Gk. *ónuks*, gen. *ónukhos* 'nail', Lat. *unguis* 'nail, claw' beside Hitt. *ṣankuwai*-, *ṣankui*- 'nail'; also Lat. *sub* 'under', *super* 'over, above', Osc. *sup*, *supruis* 'superis', Umbr. *su(b)*-, *super*, *subra*, OIr. *fo* 'under', *for* 'on, over' (cf. Gk. *hupó*, *hupér*); beside Hitt. *up*- 'rise (of the sun)', Skt. *úpa* 'up', *upári* 'over' (Ernout and Meillet 1967:660), Alb. *hyp* (Hamp 1965a:126-29). Cf. also Lat. *sine* 'without', Toch. A *sne*, B *snai* 'without' beside Goth. *inu* 'without' (Ernout and Meillet 1967:628).

The correspondence of Sanskrit zero to initial *s*- of the other branches must be distinguished from instances of *s*-mobile, which shows no dialectal regularity in the distribution of cognates with and without initial *s*:- cf. e.g. Gk. *tégos* / *stégos* 'roof' beside Skt. *sthápati* 'covers, hides', Lat. *corium* 'skin' beside *scortum* 'pelt, hide', OCS *kora* 'bark' beside *skora* 'pelt, hide', etc.

The necessity of positing a distinct sibilant **ṣ* to account for the correspondence of zero in one dialect group (including Sanskrit) and *s*- in another becomes even stronger when we consider the reflexes of this phoneme within the single Anatolian branch. It turns out that Hittite and Luwian have different reflexes of **s* and **ṣ*. PIE **s* is uniformly reflected in Hittite and Luwian as *s* (*š* in the cuneiform script), whereas PIE **ṣ* is reflected as Hitt. *s* and Luw. *t*: Hitt. *ṣakuwa* 'eyes' beside Luw. *tawi*- 'eyes' (the correspondence of Hitt. *k* to Luw. *Ø* is regular: see I.1.5.3n59); in non-initial position, Hitt. *huišwatar* 'life' beside Luw. *huit-walaḥi* 'life'. The correspondence can be explained if we assume that the phoneme written as *t* in Luwian was an interdental fricative.

In summary, IE **ṣ* yields reflexes of *s* in one group of dialects, merging with the reflexes of the other sibilant **s*; it is lost in a number of other dialects (for instance, in initial position in Sanskrit); and apparently shifts to an interdental spirant *θ* in dialects like Luwian.

36. The Baltic reflex is debated, since the correspondence of Lith. *ieškóti*, OCS *iskati*, Skt. *icchāti* points to a development of **ṣkḥ*- to **šk*- to **sk*- (Stang 1972:83-87), yet there are also parallel forms suggesting a development of **ṣkḥ*- to *-st-* (Leumann 1942, cf. Toporov 1973).

2.4.3. The labialized fricative /**śo/*

There is another set of correspondences among the daughter dialects, one for which we posit a labialized fricative. It is distinct from that (described in 2.4.1 above) pointing to initial **sw-* and requiring the diffuse fricative **s*.

Gaul. *suexos* 'sixth', Welsh *chwech* 'six' beside Skt. *ṣaṭ*, Prakrit *cha* < **kṣ-* (Wackernagel and Debrunner 1930:III.354), Avest. *xšvaš*; Arm. *vec* 'six', *vat'sun* 'sixty', Gk. *héks*; *kséstriks krithé* · *hē heksástikhos*. *Knídioi* (Hesychius), Cretan Gk. *wéks* (Schwyzer 1939:I.590), Myc. *we-* (in *we-pe-za*, Attic *hék-pous*), OPruss. *uschts* 'sixth', Lith. *ušės* 'sixth week after childbirth' (**u-*, Szemerényi 1960:78, cf. Stang 1966:279); Lat. *sex*, Goth. *saíhs*, Lith. *šeši*, OCS *šesŭ* (with probable initial **ks-*), Toch. A *ṣāk*, B *ṣkas*, Alb. *gjáshŭ* 'six'.

Lith. *sviestas* 'butter', Latv. *sviēsts* 'butter', *svaīdīt* 'smear, grease' beside Avest. *xšvīd-* 'milk', *Apa-xširā-* (name of country), Skt. *kṣīrám* 'milk', Oss. *æxsyr* 'milk', Munji *xšīr* 'milk', Alb. *hurrē* (Hamp 1965a:131).

Goth. *swiglōn* 'play flute', OHG *swēglōn*, *swēgala* 'flute' beside Skt. *kṣvédati* 'buzzes, hums, whispers', OCS *svistati* 'whistle', Pol. *gwizdać* 'whistle', OIr. *sétim* 'I blow', gloss *ind fet* 'sibilus', Welsh *chwythu* 'blow, play instrument', Gk. *sízō*, Lat. *sībilō* 'hiss, whistle'.

Goth. (*midja*)-*sweipains* 'deluge' (lit. 'middle (sc. world) disarray'), Oícel. *sveipa* 'throw', OE *swāpan* beside Avest. *xšvaēwayaṭ* (*aštrā-*) 'one who waves a whip', *xšwiwi.išū-* 'hurler of arrows', Skt. *kṣipāti* 'throws, hurls', *kṣipráh* 'fast', caus. *kṣepáyati* (Mayrhofer 1956:I.289-90).

OHG *swehur* 'father-in-law, husband's father', OCS *svetry*, Welsh *chwegr*, Lat. *socer*, Gk. *hekurós*, *hekurá* (Szemerényi 1964:290-318) beside Arm. *skesur*, *skesrayr*, Alb. *vjehërr* (Hamp 1957:84), Skt. *śvaśrū-*, *śváśura-*, Lith. *šėšuras* 'father-in-law; mother-in-law'.

Goth. *swistar* 'sister', OE *sweostor*, OIr. *siur* 'sister', Welsh *chwaer*, Skt. *svásar-*, Arm. *k'oyr* beside Lat. *soror*, Gk. *éor*, Lith. *sesuō*, OCS *sestra*, Toch. A *ṣar*, B *ṣer* 'sister'.

Goth. *swaran* 'swear', OCS *svarŭ* 'brawl' beside Russ. *ssora* 'quarrel, fight', Osc. *sverrunei* 'to the speaker', Lat. *sermō* 'talk, speech, discourse'.

Goth. *swērs* 'venerable', *éntimos*, OHG *swāri* 'heavy, grave', Lith. *sveriù* '(I) weigh', *svarūs* 'heavy' beside Lat. *sērius* 'serious' (Ernout and Meillet 1967:617), Gk. *hérma* 'ship's ballast', Welsh *chwar-*, Bret. *c'hoar-* 'happen, occur' (**fall*).

Goth. *saúrga* 'responsibility, care', *saúrgan* 'take care of, look after', Skt. *sūrkaṣati* 'take care of' beside OIr. *serg* 'illness' (non-leniting *s*), Lith. *sergù*, *siřgti* 'be sick', OCS *sraga* 'illness', Alb. *dérgjem* 'I am bed-ridden', Toch. B *sark* 'illness' (cf. Hitt. *ištark-* 'be sick': Ivanov 1968).

OHG *swintan* 'disappear' beside OCS *uvędati* 'fade, wither', 'maráinein', *qđiti* 'smoke, cure in smoke', Russ. *vjanut'* 'fade, wither', OIr. *o-sennad* 'finally', 'postremo' (Pokorny 1959:1047).

OE *swinsian* 'sing, make music', OIr. *senn-* 'play musical instrument', Lat. *sonō* '(I) sound', Skt. *svánati* 'sounds', cf. Avest. *xvanaŋ*.(čaxra-) beside Latv. *sanēi* 'sound, make noise', OIr. *sanas* 'whisper', Welsh *hanes* 'history'.

Latv. *svakas* (pl.), OPruss. *sackis* 'sap, juice of plants and fruits', Lith. *sakaĩ*, Russ. *osoka* 'sedge', Alb. *gjak* 'blood', Gk. *opós* 'sap'.

Goth. *ga-swōgjan*, *swōgatjan* 'exhale', OE *swēg*, *swæg* 'noise', Lith. *svagėti* 'sound' beside Gk. *ēkhē* 'sound'.

What is striking in this series of cognates is the fact that the initial sequence **sw-* corresponds to a variety of sequences in one or more languages, cf. Gaul. *suexos* beside Avest. *xšvaš*, Skt. *ṣṭ* < **kṣaṭ*, Gk. *kséstriks*; Lith. *sviestas* beside Avest. *xšvīd-*; Skt. *kṣīrám*; Goth. *-sweipains* 'deluge' beside Avest. *xšvaēwayaŋ*. In a number of the sets, initial *sw-* of one dialect corresponds to *s-* (without *-w-*) of others: cf. Skt. *svásar-* 'sister', Goth. *swistar* beside Lat. *soror*; Goth. *swaran* : Lat. *sermō*; Goth. *swērs* : Lat. *sērius*; and others given above. Obviously, this group of correspondences reflects an initial phoneme distinct from the one for initial **sw-*, which is preserved without alternations in all the languages (see 2.4.1 above). It was also distinct from the second fricative */*š/* posited above, since */*š/* is established by correspondences where some of the languages have zero corresponding to the initial *s-* of others.

This third sibilant phoneme must have had a feature of velarization, since its reflexes include a velar component; and it must have had labialization, reflected by clusters with an independent labial element. It can be characterized as a compact labialized phoneme.

The labial element can be missing entirely, as it is in some reflexes. And the sibilant element is missing entirely in a few others. This means that the following forms apparently also show the same correspondence:

Toch. B *sālk-* 'pull', Gk. *hélkō* '(I) pull', *holkós* 'furrow', Lat. *sulcus* 'furrow', OE *seolh* 'furrow; plow' : Lith. *velkù* '(I) pull, draw', OCS *vlěkq* '(I) draw', Avest. *varək-* 'pull', Alb. *heq* 'drag' (Hamp 1965a:131).

Avest. *xvar-* 'eat, drink', Mod. Pers. *xurđan* 'eat, drink', OIcel. *sollr* 'drink for pigs', OHG *swelhan* 'swallow' : Skt. *vālbh-* 'swallow, chew' (Gercenberg 1972:22).

Lat. *salix* 'willow', MÍr. gen. sg. *sailech*, Gk. *helikē*, Myc. *e-ri-ka*; cf. Gk. *Helikón* (< *welikón* 'mountain with willows': Chantraine 1968:338) : MHG *wilge*, OE *welig* (P. Friedrich 1970:53-55).

Cf. also the words for 'six': Gaul. *suexos* 'sixth', Welsh *chwech* 'six' (**swekh-*) : Lat. *sex*, Goth. *saíhs*, Toch. A *ṣāk* (**sekh-*) : Doric Gk. *wéks*, Arm. *vec'* (**wekh-*).

To summarize so far, the set of correspondences just surveyed points to an

original compact labialized phoneme /**śo*/ in Indo-European, with reflexes of *sw*-, *s*-, or *w*- in the various dialects. This means that the combination of sibilant and labiality must have been a single phoneme at the Proto-Indo-European stage (compare the development of the labialized velar phonemes in the daughter languages). The labial and sibilant elements segmented out into discrete phonemes in the majority of daughter languages, which may indicate that dialects of late Indo-European already had a cluster here; but the Proto-Iranian reconstruction for such words has a single labialized phoneme /*hw*/ or /*xw*/,³⁷ which must have come from a unitary phoneme /**śo*/: cf. Iranian **hwaśru* 'husband's mother': Sogd. *ʾγwšh*, Shugni *xīx*, Tajik *xusru* 'wife's mother' (PIE **śoek̑hru-* ~ **swek̑hru-*).

Iran. **hwasar* 'sister': Avest. *xvaŋhar-*, Sogd. *xw'r*, Tajik *xox_car* 'sister' (PIE **śoesor-* ~ **swesor-*).

Iran. **hwid-* 'perspire': Avest. *xvaēda-*, Mod. Pers. *xvay* 'sweat', Khotanese Saka *āhusāte* 'sweats'.

Iran. **hwan-* 'sound': Khotanese Saka *hvañ-*, Oss. *xonyn*, Tajik *xondan* 'pronounce'.

Also of interest are the monophonemic Armenian reflexes of initial **sw-* as **k'* (Meillet 1936:50):

Arm. *k'irtn* 'sweat': Avest. *xvaēda-*, Mod. Pers. *xvay*, Skt. *svédaḥ*, OSax. *swēt*.

Arm. *k'oyr* 'sister': Avest. *xvaŋhar-*, Skt. *svásar-*, Goth. *swistar*; Arm. *k'un* 'sleep': Skt. *svápnah*.

On the evidence of correspondences such as Arm. *k'un* 'sleep', Avest. *xvafsaiti* 'he sleeps', we can posit an initial **śo-*, whose subsequent development created the secondary group **sw-/*su-*, which made possible forms such as Skt. *supyāt*, opt. of Ved. *sváptu* 'may he fall asleep'. Cf. analogous secondary alternations such as Hitt. *kuen-* / *kun-* 'kill' from PIE **ghoen-* / **ghon-*, etc.

By positing a compact labial sibilant as a source for these correspondences, we also explain the appearance of the velar element *k* in the cognates: it is the reflex of the velarization that accompanied the compact labial sibilant and subsequently segmented out into a separate velar phoneme.³⁸

37. For the monophonemic status of *xw* in Iranian see also Èdel'man 1977.

38. The reflexes of compact spirants in Kartvelian (South Caucasian) are highly relevant here. The Proto-Kartvelian compact **š*, **ž*, **č*, **c'* frequently combine with *w* to yield West Kartvelian clusters *škw*, *žgw*, *čkw*, *c'k'w*, which subsequently change into hissing *skw*, *zgw*, *ckw*, *c'k'w* (Gamkrelidze 1959). An analogous development of **śo* can be posited for those Indo-European dialects in which its reflex is a cluster with a velar element (which has left a trace of its posterior articulation in the retroflex *ṣ* of Sanskrit): PIE **śoek̑h-* 'six' > Skt. **kṣaṭ* > *ṣaṭ*, Avest. *xšvaš*, Gk. *kséstriks* (probably with metathesis of *-sk-* to *-ks-*, cf. Toch. B *ṣkas*); PIE **śoei-* 'milk' > Skt. *kṣīrám*, Avest. *xšvīd-*; PIE **śoei-* 'brandish, swing' > Avest. *xšvaēwayaṭ-*; PIE **śoek̑huro-* 'father-in-law; husband's father' > Arm. *skesur*, *skesrayr*. Cf.

2.4.4. A phonological description of the Indo-European sibilant spirant system

Thus, together with the sibilants **/s/* and **/š/*, a third, compact labialized, phoneme **/śo/* must be posited for Indo-European. Together the three formed a sibilant series **/s *š *śo/*, shown in Table 6.³⁹ The unmarked and most common member of the series was **s*; **š* and **śo* were marked. The markedness relations are also shown in the frequency correlations of the sibilants.

Table 6
Feature matrix for the sibilant spirants

	<i>s</i>	<i>š</i>	<i>śo</i>
Syllabicity	—	—	—
Stopness	—	—	—
Voicing	[—]	[—]	[—]
Compactness (palatality)	—	+	[+]
Labialization	—	—	+

This three-member sibilant series is structurally parallel to the system of three posterior stop orders with its unmarked plain velar order and additional,

also the mysterious *-k-* of Lith. *áuksas* beside OPruss. *ausis* ‘gold’, Lat. *aurum*; Lith. *tūkstantis*, Latv. *tūkstuõts* (Stang 1966:282) beside OPruss. *tūsimtons* ‘1000’, Russ. *тысяча*, Goth. *pūsundi*.

39. Benveniste (1954) hypothesized that the difference between Hittite *s* and *z* in words where cognates have *s* elsewhere in Indo-European reflects an Indo-European phonemic distinction. However, there are two obstacles to this interpretation: the Hittite signs indicating *š* and *z* fluctuate in the rendition of a single morpheme (e.g. *-šepa-* ‘spirit’ in *Kamru-šepa-* but *-zipa-* after *-n*, etc., in *dagan-zipa-*); and Hittite words with *-z-* have cognates with an *-s-* which is not distinct from the *-s-* that corresponds to Hitt. *-š-*: e.g. Hitt. *zena-* ‘autumn’ (KUB XXXVIII 32 I 8, and elsewhere; see Ehelolf 1927:149-50, Goetze 1951:469, Souček and Siegelová 1974:43, note 9), loc. *zeni* (KBo II 13, Rs. 25) ‘in autumn’, ORuss. *oseni* ‘in autumn’ (locative: Toporov 1959:15, 23, 219), Serbo-Cr. *jěsěn*, Cz. *jeseň*, OPruss. *assanis*, Goth. *asans* ‘harvest time’ (Stang 1972:74).

Also unconvincing is Benveniste’s distinction of two endings, genitive (Hitt. *-as*) and ablative (Hitt. *-az*), which fell together in forms such as Skt. *-as* > *-ah* (genitive-ablative). For a critique of Benveniste’s theory see Lazzaroni 1962.

Hitt. *zakkar* ‘feces’ (translation equivalent of Akkad. *zû* in the lexical text KBo I 45 I 9) is of considerable interest to this problem. It is clearly a variant of *šakkar* ‘feces, excrement’ (KUB XVII 28 I 5), gen. *šaknaš* (KUB VII 5 I 9), where beside the *s* of Gk. *skōr* there is an irregular correspondence of *š* < **k̥h* in Skt. *śákṛt*.

For the particle *-za* of Benveniste’s etymology, comparison to the semantically equivalent Luwian particle *-ti* is preferable.

marked palatalized and labialized orders.

In the *centum* dialects, all three sibilant phonemes merge into a single diffuse sibilant. */*ʃ/* shifts to */*s/*, while */*ʃo/* is segmented out into two independent phonemes *s* and *w*, reflected as the sequence *sw*. This is entirely analogous to the development of the posterior stop series in the *centum* languages, where the palatovelar series merged with the plain velar series and the labiovelars segment out into clusters *kw*, etc.

The transformations of the sibilants in the *centum* dialects can be represented as in (5).

- (5) a.
$$\begin{bmatrix} - \text{compact} \\ - \text{labialized} \end{bmatrix} \Rightarrow \begin{bmatrix} - \text{compact} \\ - \text{labialized} \end{bmatrix} / \begin{bmatrix} - \text{syllabic} \\ - \text{stop} \end{bmatrix}$$
- b.
$$\begin{bmatrix} + \text{compact} \\ - \text{labialized} \end{bmatrix} \Rightarrow \begin{bmatrix} - \text{compact} \\ - \text{labialized} \end{bmatrix} / \begin{bmatrix} - \text{syllabic} \\ - \text{stop} \end{bmatrix}$$
- c.
$$\left\{ \begin{bmatrix} + \text{labialized} \\ + \text{compact} \end{bmatrix} \right\} \Rightarrow \begin{bmatrix} - \text{labialized} \\ - \text{compact} \end{bmatrix} / \begin{bmatrix} - \text{syllabic} \\ - \text{stop} \end{bmatrix}$$

2.4.5. Phonological interaction and redistribution of the reflexes of Indo-European sibilants and palatovelars in the *satem* dialects

In the *satem* languages, unlike the *centum* group, the changes of the Indo-European sibilant series led to more essential restructurings, conditioned by the new correlations that were arising among the reflexes of palatovelar stops and the reflexes of the palatalized sibilants. Assibilation of the Indo-European palatovelars led to the formation of new systems of spirants which interacted with the reflexes of the Indo-European sibilants and underwent structural redistribution.

A common tendency governing the restructuring of the sibilants in the *satem* dialects is elimination of the accessory features of palatalization and labialization and the consequent movement of the marked fricative phonemes toward merger with the unmarked **s*. There is similarity between the behavior of the palatalized **ʃ* and the palatovelars in the *satem* dialects. This is particularly true of Sanskrit, where the spirant **ʃ* is eliminated completely while the palatovelar stop series is eliminated by its shift to affricates and spirants.

It must be assumed that the distribution of the least marked spirant *s exhibited some restrictions imposed by the neutralization of the *s/*ʃ opposition in certain positions. One such position of neutralization was after *i, u, r, k*, where only the palatalized (compact) member of the opposition could appear.⁴⁰ The subsequent evolution of the sibilants in the *satem* languages can easily be explained if we assume a general tendency toward diffuseness as well as the following original distributional rule: in the *satem* branches, the sibilant phonemes take the form of the diffuse spirant *s* except after *i, u, r, k*, where we find the compact *ʃ* as a direct reflex of Indo-European *ʃ and sometimes *ʃo:

PIE [*-iʃ-]:

Skt. superlative suffix *-iṣṭha-*: *svādiṣṭha-* 'sweetest'; cf. Gk. *hēdistos*, OE *swētest*.

PIE [*-rʃ-]:

Skt. *tṛṣ-nā* 'thirst', *tṛṣyati* 'he is thirsty', Arm. *t'arāmim* / *t'aršamim*, cf. Gk. *térsomai* '(I) become dry', Goth. *þaúrsus* 'dry'.

Skt. *mṛṣyate* 'forgets', Arm. *moʀanam* '(I) forget', Lith. *miṛšti* 'forget'.

Skt. *varṣmán-* 'height, top', Lith. *viršūs* 'top', OCS *vrǫxŭ*, Russ. *verx*.⁴¹

PIE [*-uʃ-]:

Skt. *mūḥ*, *mūṣ-aḥ* (RV X, 33, 3) 'mouse', *mūṣikā* 'testicle', Sogd. *mwškyc* 'wild cat' < **mūṣ-kuštar-* 'killer of mice' (Mayrhofer 1963:II.668), Baluchi *mušk*,⁴² Arm. *mukn* (see 2.3.4 above), Alb. *mi*, OCS *myši*, Russ. *myš*'; cf. Lat. *mūs*, Gk. *mūs*, OHG *mūs*.

ORuss. *byx*", OCS *byxŭ* (1sg. aor. of *byti* 'be'), cf. Gk. *éphusa*.

PIE [*-kʰʃ-]:

Skt. *dákṣiṇaḥ* 'right', Avest. *dašinō*,⁴³ Lith. *dėšinas*, OCS *desnŭ*: cf. Gk. *deksiterós*, Lat. *dexter*.⁴⁴

Skt. *á-vāk-ṣ-am*, aor. of *vāhati* 'rides, conveys'.

Skt. *ukṣā* 'bull', Avest. *uxšan-* 'bull'; cf. Goth. *aúhsa*, OHG *ohso*, Welsh *ych*, Toch. B *okso*.

40. This distribution is explained by the phonetic nature of the neutralizing context: after the palatal *i* and the velar *u, k, r* it is phonetically natural for a compact fricative to occur (in Sanskrit, the retroflex *ʃ*).

41. Slavic **rʃ* subsequently changes to **rx*.

42. Kafir *mūsā* (*contra* Burrow 1955:32, Mayrhofer 1963:II.668) is to be regarded as due to a change of a compact spirant to diffuse. This change reflects the general tendency to change compact sibilants to diffuse; cf. the Dardic affricate *c* from the compact Indo-Iranian reflex of an Indo-European palatovelar; cf. also the analogous tendency of Armenian.

43. Avest. *dašinō* comes from **dakṣiṇō*, cf. Avest. *aši* beside Skt. *ákṣi* 'eye'. Slavic *desnŭ* is a later version of a form with **ʃ* < **ʃ* as in Lith. *dėšinas*. For the Baltic and Slavic development see Karaliunas 1966, Hamp 1967, Andersen 1970.

44. It is interesting that we find *i* chiefly in forms from Greek, Celtic (Gaul. *Dexsiva* *dea* = Gk. **Deksiwós*, Myc. *de-ki-si-wo*), Indo-Iranian, and Baltic, when identical forms with the same suffixes in other languages lack this *-i-* (Goth. *talhsa* with suffixed *-*wo*, Lat. *dexter* with suffix *-*ter*). Perhaps this is a graphic means for rendering the phonetic reflex of the original palatalized sibilant.

The *ṣ* and *s* of these dialects fall in with the reflexes of the palatovelar **ḱh*. This leads to phonological redistribution of the original reflexes of the Indo-European palatovelars and spirants, as in Skt. *piṣṭá-* < **piś-* + **-ṭa-* < **piḱh-* + **-tho-* 'decorated, painted' (Lat. *pictus*) and *piṣṭá-* < **pis-* + **-tho-* 'crushed' (Kurylowicz 1973b:67), with *ṣ* from **s* and *ś* from **ḱh* merging after *i*, *u*, *r*, and *k* in Sanskrit.

The developments of the spirant series and the palatalized stops, including the subsequent mergers of their reflexes and redistributions in the phonemic system, can be represented schematically as in Table 7.

2.4.6. Evidence of possible postvelar and labiodental series of phonemes in Indo-European

The reconstruction of the Indo-European stop series, including the orders of posterior stops, was based on strict correspondences among the forms of the daughter dialects. The correlations established among the individual phonemic orders of the daughter languages, with account taken of their positional and combinatory behavior, permit us to reconstruct the proto-phonemes that lie behind them, establish a first approximation to their distributional rules, and determine their interrelations in their own phonemic system. The departures from the regular correspondences that have been observed can be traced to positional properties of the proto-phonemes.

However, when there is no satisfactory explanation based on combinatory or positional variation, it is natural to see an exception to an established correspondence not as an exception but as a regular correspondence reflecting a different phoneme. Then that phoneme, too, must have its own place in the reconstructed system and enter into regular phonological relations with the proto-phonemes already reconstructed.

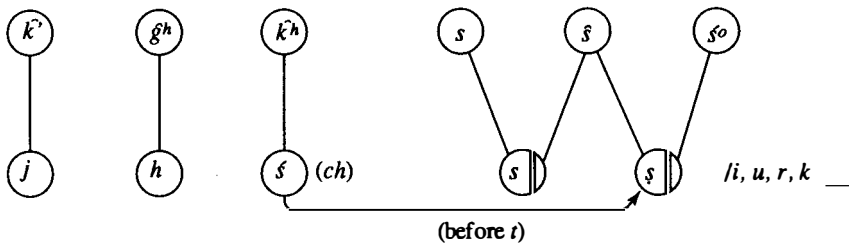
As we analyze the reflexes of the posterior stops in the Indo-European daughter languages, we notice a number of departures from the regular correspondences, departures which cannot be explained as due to positional distribution of the proto-phonemes. One such departure is exhibited by forms which have initial *k-* in a number of languages but zero in others:

Lat. *costa* 'rib', OCS *kostī* 'bone', Hitt. *ḫaṣṭai* 'bone'⁴⁵ beside Lat. *os(s)* 'bone', gen. *ossis*, Skt. *ásthi* 'bone', Avest. *asti-*, Gk. *ostéon*, Alb. *asht*, *ashtë* (see Schmitt-Brandt 1967:106).

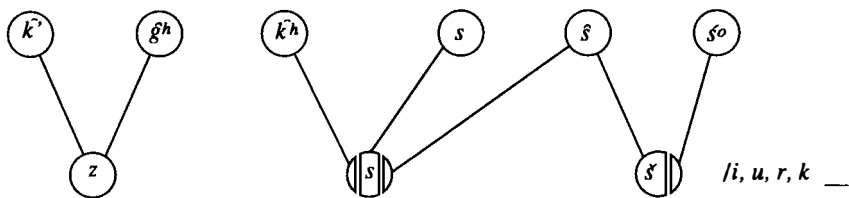
45. The Hittite initial *ḫ* must be assumed to reflect the postvelar posited below, not the laryngeal that has the same Hittite reflex *ḫ* [x] (see below). We must evidently assume merger of the Hittite reflexes of the postvelar stop and the laryngeal, as a voiceless velar spirant.

Table 7

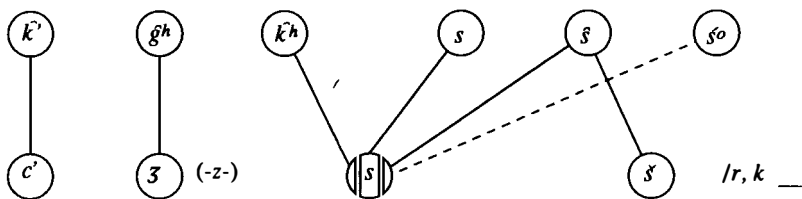
Sanskrit



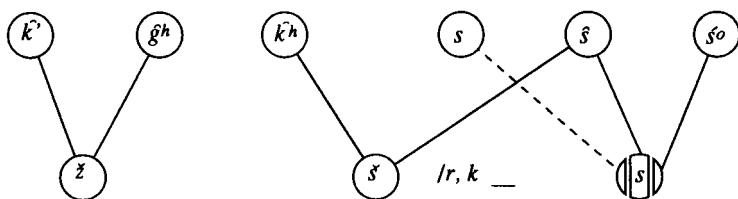
Old Iranian (Avestan)



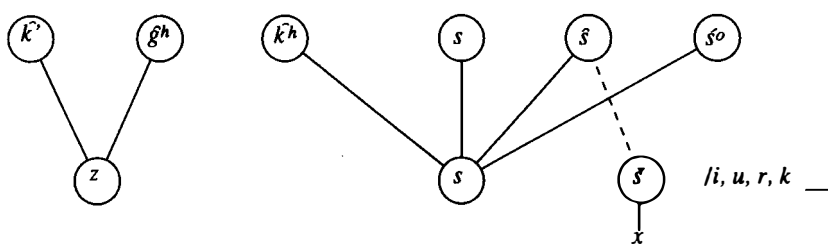
Armenian



Baltic (Lithuanian)



Slavic



OCS *koza*, 'aiks', Russ. *koza* 'goat', Alb. *kec*, OE *hēcen* 'kid' beside Skt. *ajāh*, MPers. *azak*, Alb. *dhi*, Lith. *ožys* 'goat', cf. OCS (*j*)*azno* 'hide, pelt; shirt' (see Jakobson 1966a:341-53, Ivanov and Toporov 1974).

Goth. *hatis* 'hatred', *hatan* 'hate', caus. *hatjan*; Welsh *cawdd* 'anger', *cas* 'anger', Osc. *cadeis* 'inimicitiae' beside Lat. *ōdī*, *ōsus sum*, Gk. *odús(s)asthai* 'be angry', Arm. *ateam* 'I hate', OE *atol* 'ugly, misshapen'.

Gk. *kólēps* 'hollow under the knee', Russ. *koleno* 'knee', Lith. *kelėnas*, *kėlis* 'knee', Hitt. *ḫaliya-* 'kneel',⁴⁶ OHitt. *ḫaliḫla-* 'kneel uninterruptedly' (2 BoTU 12 A 21: LUGAL-un-wa-az mekki ḫaliḫlatti 'and you have knelt before the king many times'; the archaic ritual KUB XXIX 1 IV 1: *nat-šan ḫašši ḫaliḫliandari* 'and they kneel before the altar the whole time'; with archaic reduplication: van Brock 1964:141) beside Skt. *ānīh* 'upper leg' < **olnis*, *aratnīh* 'elbow' < **oln-tn-*, Gk. *ōlénē*, Lat. *ulna* 'elbow' < **olina*, Lith. *uolektis*, *alkūnė*, Russ. *lokot* 'elbow'.

Gk. *káruon* 'nut', Panjabi *karuā* < **karu-k* (Turner 1966:140) beside Gk. *árua*, Alb. *árrē*, Lith. *ruošutys*, OCS *orěxū* 'nut, walnut'.

Skt. *kapí-* 'ape', Gk. *kēpos* (*kēbos*) 'long-tailed monkey' beside OIcel. *api*, OE *apa* 'ape', Celt. *abrános* (Hesychius).

Lat. *cōram* 'face to face' beside Skt. *āḥ* 'mouth', gen. *āsaḥ*, Avest. *āh-*, Lat. *ōs*, gen. *ōris*, Mlr. *á* (gen.) 'mouth', Hitt. *aiš* 'mouth', gen. *iššaš*, OIcel. *óss* 'mouth of river'.

In addition to these examples with their initial alteration of *k-* and zero among the Indo-European dialects and sometimes within one language, we also find an example with an alternation of initial *g-*, *i-*, and *Ø*:

Lat. *geminus* 'twin': Skt. *yamáḥ* 'twin', Avest. *yāma-* 'twin', Latv. *jumis* 'double fruit', OIcel. *Ymir*, name of hero, similar to the Indo-Iranian *Yamáḥ* (Dumézil 1971:143ff.), Mlr. *emon* 'twins'.

All these correspondences are exceptions to the regular reflexes of the Indo-European velar stops. To explain them, we can posit separate postvelar (possibly uvular) phonemes, which probably had a more posterior articulation than the velar stops. To judge from the reflexes in the daughter languages, this hypothetical postvelar order must have comprised a glottalized stop **q'* (which gave rise to the correspondence of initial *g-* and *y-*)⁴⁷ and a voiceless aspirated stop **q^h* (which gave rise to the correspondence of initial *k-* and *Ø-*). The daughter languages give no evidence of a third member of this postvelar order; in view of its markedness, it may have been lacking entirely. In phonological systems with postvelar or uvular stop orders, the most marked member is the voiced /G/; most systems with postvelar stops have a gap at this point (Gamkrelidze 1974).

46. Hitt. *ḫ* is to be explained as in *ḫaštai*.

47. A typological analog is the development of Proto-Daghestanian **q'* in Lak, where it is preserved as *q'* word-finally but reflected as *y* elsewhere (Giginejšvili 1973, 1977).

Thus we can posit an Indo-European postvelar stop order with some degree of certainty. Its members subsequently merge with the reflexes of the velars or, in a number of languages, are lost entirely. The possibility of the postvelar order is dictated to a significant extent by typological considerations bearing on systemic correlations of posterior stop series. However, the factual material of the Indo-European daughter languages does not have the degree of inductive significance that guarantees the reality of the reconstructed velar orders. Therefore the status of the postvelar stops of Indo-European is more hypothetical. They may have pertained to an earlier stage of development, prior to the breakup into daughter stocks.

Another extremely hypothetical construct is a labiodental stop order, which could be proposed on the evidence of the following correspondences:

dw-	~	d-	~	w-	~	(e)rk-	~	b-
Skt. <i>dváu</i>		Hitt. <i>ta-a-i-</i>		Goth. <i>wi-t</i>		Arm. <i>erku</i> ⁴⁸		Avest. <i>baē</i>
Avest. <i>dva</i>		<i>u-ga-aš</i>		'we two'		'2'		'2'
'2'		'two-year-		Gaul. <i>Vo-corii</i> ,				Kafir
Gk. <i>dō-</i> <		old'		<i>Vo-contii</i>				(Waigali)
<i>dwō-</i> in	-	<i>ta-a-an</i>		Toch. A masc.				<i>baš</i> '12'
<i>dō-deka</i>		'second'		<i>wu</i> , fem. <i>we</i>				
'12'		OIr. <i>dáu, dó</i>		Toch. B <i>wi</i> ⁴⁹ '2'				
Alb. <i>dy</i> '2'		'2'		WGk., Boeot.,				
Goth. <i>twai</i> ,		Gk. <i>di-</i>		Thess.				
<i>twōs</i>		(Pokorny		<i>wikati</i> ,				
Lith. <i>dvi</i>		1959:229)		<i>eikosi</i>				
'2'				Lat. <i>uigintī</i>				
OPruss. <i>dwai</i>				'20'				
				OIr. <i>fiche</i>				
				Arm. <i>k'san</i> '20'				
Avest. <i>dvaēθā-</i>		Lat. <i>dīrus</i>				Arm. <i>erknč'im</i>		
'threat'		'dire'				'I fear'		
Gk. <i>déos</i>		(Ernout and						
(< * <i>dweios</i>)		Meillet						
'fear'		1967:176)						

48. Cf. the similar development in OIcel. *kvistr, kvísl* 'branch' (Pokorny 1959:232).

49. Hamp (1952:136, note 1) proposed initial *H on the evidence of Toch. B *ikām* < **yikān* 'twenty'; but this initial is due to the specifically Tocharian palatalization of **w* to *y*.

These fluctuations in the treatment of a labial complex with a dental stop may testify to the originally monophonematic nature of the sequence. Then the source may have been an Indo-European glottalized dental phoneme with labialization.

There may have been other members of the labialized dental order, **dʰo* and **tʰo*:

Skt. *dhvárati* 'harms', ppl. *dhruṭá-*, Hitt. *du-wa-ar-na-aḥ-ḫu-un* 'I destroyed': cf. Lat. *fraus* 'deception', *frūstra* 'mistakenly', Umbr. *frosetom* 'fraudātum', OIcel. *dvergr* 'dwarf' (Mayrhofer 1963:II.119).

Skt. *tvām* 'you' (acc.), Gk. *sé*, Arm. *k'ez*: cf. Hitt. *te*, OCS *tę*.

Skt. *tvárate* 'hurries', Avest. *θwāša-* 'hurried, hasty', OHG *dweran* 'turn hastily': cf. Gk. *otrērós* 'hastily' (with added initial *o-*), Lat. *trulla* 'scoop, dipper, ladle; brazier', OLat. *trua*, with secondary metathesis in Latin (Pokorny 1959:1100).

Skt. *tvacas-*, *tvák-* (fem.) 'hide, pelt', Gk. *sákos* 'shield (of leather or hide)', Hitt. *tuekka-* 'body, being' (cf. *tuekkant-* 'corporation' in the Hittite Laws).⁵⁰

These examples serve only to illustrate the possibility that there may have been such an order in the Indo-European phonological system. It would be typologically plausible, since there are labialized consonants among the posterior stop orders. However, there are not enough forms showing these correspondences to make this proposal more than hypothetical. Nonetheless, the elements deduced from internal reconstruction and typological considerations may point to correlations that existed in the Indo-European phonological system at an earlier stage of development, well before the time of its breakup into independent daughter branches.

2.5. The Indo-European system of obstruents (stops, spirants) in structural comparison to typologically similar systems: Kartvelian (South Caucasian), Abkhaz-Adyghe (Northwest Caucasian), Semitic

The stop and spirant system for the early stages of Indo-European can be set up as shown in Table 8.

50. Also relevant here may be PIE **dʰwer-* / **dʰur-* 'door': Skt. *dvārah*, Avest. acc. sg. *dvaram* 'gate, courtyard', Lat. *forēs* 'double door', OCS *dvorŭ* 'yard', Gk. *thūra*, Arm. *durk* 'doors'. The alternation of syllabic and nonsyllabic *u* in this form may reflect a relatively late, post-breakup and dialectal, decomposition of an initial monophonemic element into **dʰ* and **w*. Cf. the development of the labial element of the original phoneme **śo* and the labiovelars. In this respect, the monophonematic reflexes of Kafir (Ashkun *vekā* 'door', *bē* 'outdoors'; cf. Lat. *forēs* 'outside') may go directly back to the ancient labialized phoneme.

Table 8
The Indo-European stop and sibilant system

I	(p')	t'	t'o	k'	k̥'	k'o	q'
II	b ^h	d ^h	d ^h o	g ^h	g̊ ^h	g ^h o	—
III	p ^h	t ^h	t ^h o	k ^h	k̊ ^h	k ^h o	q ^h
				s	ṣ	so	

The unboxed parts of Table 8 represent the consonants whose reconstruction is problematic: the postvelar and labiodental orders (*q', *q^h and *t'o, *d^ho, *t^ho), which can be posited only with the reservations mentioned above.

As Table 8 shows, the labial and dental orders lack palatalized members and the labial order lacks labialized ones.⁵¹ Consonants of such types arise in the individual daughter languages to fill the gaps in the parent system. This happens in some of the dialects that eliminate the palatalized order and merge Series I and II, specifically in Celtic and Balto-Slavic. In Balto-Slavic the following oppositions arise:

<i>b</i>	<i>p</i>	<i>b'</i>	<i>p'</i>
<i>d</i>	<i>t</i>	<i>d'</i>	<i>t'</i>
<i>g</i>	<i>k</i>	<i>g'</i>	<i>k'</i>

(The palatals *g'*, *k'* fill the positions freed after elimination of the original Indo-European palatovelars.)

The reconstructed Indo-European stop system finds a very close typological parallel in Caucasian languages. In particular, the stop system posited for Proto-Kartvelian (South Caucasian) shows the same number of series and orders and approximately the same phonological oppositions among the series and orders as the Indo-European system does. Proto-Kartvelian had a stop system consisting of three series (I, glottalized; II, half-voiced; III, voiceless aspirated) and four points of articulation (labial, dental, velar, postvelar). The postvelar order had a gap in the most marked, voiced, slot (Gamkrelidze 1974:16). The half-voiced stops, which were phonetically distinct from true voiced stops in their lower degree of sonority (Axvlediani 1949:58ff.) and characterized by intensivity,⁵² can be compared to the Indo-European voiced aspirates (see 1.2.2 above).

51. For the typological possibility of labialized labials see 2.1.2 above (cf. Chomsky and Halle 1968:307).

52. For half-voiced consonants see Postal 1968:78, note 23.

Table 9
The stop and sibilant system of Proto-Kartvelian⁵³

I	<i>p'</i>	<i>t'</i>	<i>k'</i>	<i>q'</i>
II	<i>b</i>	<i>d</i>	<i>g</i>	—
III	<i>ph</i>	<i>th</i>	<i>kh</i>	<i>qh</i>
	<i>s</i>	<i>š</i>	<i>š̥</i>	
	<i>z</i>	<i>ž</i>	(<i>ž̥</i>)	

Typologically even closer to Indo-European system are the Northwest Caucasian languages, in particular Abkhaz. There is a three-way opposition of glottalized, voiced, and voiceless (aspirate) consonants at each point of articulation: labial, dental, velar, and postvelar; there are also palatalized and labialized modifications of the velar orders, and a labialized modification of the dental order. Gaps are found in the postvelar series and its palatalized and labialized modifications at the point of the maximally marked voiced members. The overall pattern of stops and sibilant spirants of Abkhaz is shown in Table 10 (see Deeters 1963, Lomtadze 1976).

Table 10
The stop and sibilant system of Abkhaz

I	<i>p'</i>	<i>t'</i>	<i>t'o</i>	<i>k'</i>	<i>k'</i>	<i>k'o</i>	<i>q'</i>	<i>q'</i>	<i>q'o</i>
II	<i>b</i>	<i>d</i>	<i>do</i>	<i>ḡ</i>	<i>g</i>	<i>go</i>	—	—	—
III	<i>ph</i>	<i>th</i>	<i>tho</i>	<i>k̂h</i>	<i>kh</i>	<i>kho</i>	—	<i>qh</i>	<i>qho</i>
	<i>s</i>	<i>š</i>	<i>š̥</i>	<i>šo</i>	<i>š̥</i>	<i>šo</i>			
	<i>z</i>	<i>ž</i>	<i>ž̥</i>	<i>žo</i>	<i>ž̥</i>	<i>žo</i>			

The three Indo-European stop series coincide to the point of identity with those of Kartvelian and Abkhaz. The Abkhaz consonantism, in view of its accessory palatalized and labialized velars (and its labialized dentals), is even closer to Indo-European than Kartvelian is.

In the voiceless spirants, the opposition of compact to diffuse coincides in all three systems. In some dialects there is a tendency to merge the palatalized sibilant order with the diffuse one.

The major difference between Abkhaz and Kartvelian, on the one hand, and

53. See Mačavariani 1965. This system is exactly that of Old Georgian, except for the merger of the marked hissing-hushing order with the diffuse order.

Indo-European on the other, is the presence of a rich inventory of affricates in Abkhaz and Kartvelian. Affricates, evidently lacking in Proto-Indo-European, arose only later, in the individual *satem* dialects.

On this interpretation, the Proto-Semitic consonant system also bore essential similarity to Indo-European. Proto-Semitic, shown in Table 11, had a three-way opposition of emphatic (I) to voiced (II) to voiceless (aspirated) (III), as well as a rich system of sibilant spirants (see Moscati et al. 1980:24).

The 'emphatic' consonants, which are distinguished by pharyngealization in some attested Semitic languages (see Jakobson 1957b), can be interpreted as glottalized for the stage of Proto-Semitic linguistic unity and perhaps later (Cantineau 1952:290ff., Martinet 1953b:68ff.). They evidently formed a glottalized series with the expectably missing labial member. In this respect, the Proto-Semitic glottalized series coincides fully with the Indo-European one, where the labial member is also missing (or in any event weakly attested) (see also Bomhard 1975, 1977).

Table 11
The stop and sibilant system of Proto-Semitic

I	—	<i>t̤</i>	<i>k̤</i>			
II	<i>b</i>	<i>d</i>	<i>g</i>			
III	<i>pʰ</i>	<i>tʰ</i>	<i>kʰ</i>			
		<i>d̤</i>		<i>z</i>		
		<i>ḏ</i>				
		<i>t̤</i>		<i>s</i>	<i>š</i>	<i>ṣ</i>
		<i>t̤̣</i>		<i>ṣ̣</i>		

The change of the Semitic ejectives to 'emphatic' or pharyngeal consonants is comparable to the Indo-European elimination of ejectives through voicing or deglottalization. Likewise, the voicing of the ejectives in Indo-European, motivated by the phonetic closeness of glottalized and voiced stops, finds a good typological parallel in the voicing of the Semitic emphatics in the *gāl* dialects of Arabic (see Blanc 1965).

The Semitic voiceless aspirated series is typologically comparable to the Indo-European voiceless (aspirated) series and with those of Kartvelian and North Caucasian. Like these, the Semitic series has phonologically redundant aspiration and contrasts with the other series only in its voicelessness.

The general similarity in the development of Indo-European and Semitic is further manifested in the transformation of the spirants, where the articulatorily

unstable palatalized *š merges with the hissing or hushing spirants in the attested dialects.

The Proto-Semitic system differs from those of Indo-European and Caucasian in having a distinct set of interdental spirants: voiced *ḏ (Arabic ḏ, WSem. z, Akkad. z) and voiceless *ṭ (Arab. ṭ, WSem. ṣ, Akkad. ṣ); emphatic voiced *ḏ̤ (Arab. ḏ̤, WSem. ṣ̤, Akkad. ṣ̤), emphatic voiceless *ṭ̤ (Arab. ṭ̤, WSem. ṣ̤, Akkad. ṣ̤).

If we assume that the emphatic stops of Semitic were originally glottalized, then we can also regard the emphatic spirants *ṣ̤, *ṭ̤ as originally glottalized. However, the emphatic spirants also include voiced *ḏ̤, for which glottalization cannot be proposed: glottalization and voicing are incompatible. Therefore, by the criterion of consistent and homogeneous description, glottalization must be ruled out for all of the emphatic spirants as a group. Thus the Proto-Semitic spirant system is further distinguished from the stops in lacking distinctive glottalization; pharyngealization serves as a functional equivalent to glottalization in the spirant system. It may well have been the presence of pharyngealization in the spirants that influenced the phonetic shift of the ejectives to pharyngealized or 'emphatic' stops.

Since pharyngealization and labialization are variants of a single phonological feature, flatness (Jakobson, Fant, and Halle 1962, Jakobson 1971a; *rounding* in Chomsky and Halle 1968:309-11), labialization can be posited as a phonological variant of the Proto-Semitic emphatic spirants.⁵⁴ On this interpretation, the Proto-Semitic spirant system is even more similar to those of Proto-Indo-European and the Caucasian languages. The reanalyzed Semitic system is shown in Table 12.

Table 12
The Proto-Semitic spirant system,
with the emphatic spirants interpreted as labialized

<u>t</u>	<u>d</u>	<u>to</u>	<u>do</u>
s	z	so	
š			
ṣ			

54. In contemporary Arabic dialects such as Egyptian, rounding can be observed to accompany pharyngealization (Harrell 1957:71).

2.6. Combinatory constraints on the stop points of articulation in the root. The structure of Indo-European consonant clusters

2.6.1. Combinatory rules for stops of different series and orders within the root

Since a fairly full stop system can be reconstructed for Indo-European, we can formulate general combinatory rules for stops in roots of the shape C_1VC_2- , as well as investigating the structure of consonant clusters which arose in zero-grade forms of the shape $C_1C_2-VC_3-$ and at morpheme boundaries as in $C_1VC_2-C_3-$. When the phonological oppositions of the phoneme series and orders have been defined in terms of distinctive features, each phoneme can be unambiguously defined as a bundle of distinctive features arising at an intersection point of the series and orders. Thus the combinatory rules governing consonants within roots (in distant sequences) and clusters (in contact sequences) can be formulated in terms of distinctive features. The ordering of the rules gives a full and consistent account of combinatory conditions on stops within the root or stem, and applies to both distant and contact sequences.

The Indo-European combinatory rules for consonants in the root given as Rules 1-4 in I.1.3 above can be hierarchically ordered according to the number of consonant combinations they describe. The rules are as follows.

(a)⁵⁵ No two consonants of the same order can cooccur in a root.⁵⁶

There are no Indo-European roots of the form $*t'edh-$, $*dhet'-$, $*k'ekh-$, $*khek'-$, $*khoekho-$, $*khekħ-$, etc.⁵⁷

(b)⁵⁸ A consonant of Series II and of Series III cannot cooccur in a root.

There are no Indo-European roots of the shape $*bħeth-$, $*tħebh-$, $*ghoeph-$, $*phegho-$, etc.⁵⁹

At first glance, roots of the form $s + \text{voiceless stop} \dots \text{voiced aspirate}$, i.e.

55. See Rule 1 of I.1.3.1 and Rule 1' of 2.2.5.

56. This restriction also applies to the additional palatovelar and labiovelar series, which function as independent orders equivalent in their distributional possibilities in the root to the three basic articulatory orders.

57. The impossibility of two identical consonants in a root is a case of Rule (a). The same applies to the non-occurrence of two labial phonemes within a root (see Magnusson 1967).

58. See Rule 4 of I.1.3.1.

59. The impossibility of combinations like $*ghoekho-$ or $*khoegho-$ follows from the stronger Rule (a).

STVDh, would appear to be an exception to Rule (b), and indeed this structural type is often described as a supplementary case to the rule (Meillet 1937:174 [1938:191], Szemerényi 1972:143). Examples are Skt. *stighnoti* 'rises, goes up', OCS *stignq* '(I) go', Gk. *steikhō* '(I) go', Goth. *steigan* 'go up', OIr. *tíagu* '(I) go'. However, this shape is not an exception to Rule (b), since after initial *s- we have not a phoneme of Series III, as is usually assumed, but an archiphoneme representing neutralization of Series II and III (see above on Siebs' Law for this neutralization). Thus the T of the schematic type represents the neutralized Series II/III, which means that in principle all such roots conform to the permissible root shape with two consonants of the same series, II or III.

(c)⁶⁰ Two consonants of Series I cannot cooccur in the same root.

There are no Indo-European roots of the shape *k'et'- or *t'ek'-.⁶¹ That there are no roots of the shape *k'ek'- or *t'et'- follows from Rule (a).

(d) Consonants of Series I and II virtually never cooccur in one root.

Roots of the shape *bhek'- or *k'ebh- are extremely rare in Indo-European.⁶²

These combinatory rules for obstruents reduce to a single more general rule governing consonant cooccurrence in roots of the form C₁VC₂-:

(e) In Proto-Indo-European roots of the form C₁VC₂-, the two consonants must be homogeneous in voicing.

The two consonants of such a root must either both be voiced or both be voiceless. This means that if one of the stops is glottalized (and hence voiceless), Rule (c) determines that the other can only be a voiceless aspirate. We thus arrive at the following combinatory possibilities for C₁VC₂- roots:

60. See Rule 2 of I.1.3.1.

61. In traditional terms this is formulated as a constraint against the cooccurrence of two voiced stops in a root.

62. Proto-Indo-European roots which are exceptions to this rule are *b^hak'- (Skt. *bhag-*, *bhaj-* 'apportion', *bhāga-* 'share, portion', Gk. *phageîn* 'eat', Toch. A *pāk*, Proto-Sl. **bogŭ*, unless the latter two are Iranian loans) and *b^hāk'o- 'beech' (with dialect restrictions, discussed below). *k'egh- 'branch' is attested only in Germanic and Baltic (Norw. *kage*) and cannot be considered Proto-Indo-European. Skt. *bhad-rá-* 'happy' is sometimes claimed to be cognate to Skt. *bhand-*; in that case, it cannot be cognate to the Germanic form of Goth. *batiza* 'best' and thus does not represent the type of root at issue. The two roots that do represent this type are unusual both in their root structure and in their *ā vocalism.

Permitted combinations	Not permitted
I + III, III + I	I + I
II + II	II + III, III + II
III + III	I + II, II + I ⁶³

or, using phonetic cover symbols:

Permitted	Not permitted
T'eTh-	T'eT'-
Thet'-	DheTh-
DheDh-	TheDh-
TheTh-	T'eDh-
	DheT'-

These conclusions show that consonant combinations in C_1VC_2 - roots were extremely limited. In some respects this picture differs from traditional conceptions of stop combinations in Indo-European roots, as formulated e.g. by Meillet 1937, Lehmann 1952, Szemerényi 1970:92, Jucquois 1966, 1971; see also Magnusson 1967. Our rules make it possible to give a shared basis for the restrictions on obstruent cooccurrence in the root: two consonants differing in voicing cannot cooccur. They explain the impossibility of Proto-Indo-European roots containing stops of Series II and III, i.e. a voiced (aspirate) and a voiceless (aspirate) stop, which cannot be accounted for by the traditional approach.


These rules automatically provide for the cooccurrence of consonants of the same series, with the restriction given by Rule (a). An exception is the constraint against cooccurrence of ejectives, provided for by Rule (c). It has a phonetic and phonological typological explanation.

In summary, the Indo-European Series I is distinguished from Series II and III in that the ejectives of Series I cannot combine with one another in one root; consonants of Series II and III can cooccur with other consonants of the same series as long as the constraints on point of articulation (discussed below) are observed. Series I and III can cooccur, while Series II is the most isolated, unable to combine with the other two. Series III has the greatest distributional freedom: it can combine both with itself and with Series I, but not with Series II (as shown in Rule b). The distributional relations among the phonemes of the various series are shown in Table 13.

63. This combination is statistically very rare, found only in a few dubious examples (see note 62).

Table 13
 Combinability of the three series in one root
 (arrows show possible cooccurrences)

I	II	III
(p')	bh	ph
t'	dh	th
k'	gh	kh
k̂'	ġh	k̂h
k'o	gho	kho



2.6.2. Variation of stops within the root

Within the bounds set by the possible consonant combinations for the Indo-European root or stem, variation of consonants was possible; the variants have sometimes been sorted out among the individual daughter languages. This consonant substitution did not change the meaning of the root. The only variation permitted was substitutions allowed by the basic root canon. Thus, for example, a root of the shape II + II could vary with III + III, but not (following Rule b) with III + II or II + III; a root of the shape III + III could vary with I + III and III + I, but not (following Rule c) with I + I.

An example of II + II alternating with III + III:

PIE *ghabh- ~ *khaph-: Lat. *habēre* 'have', Skt. *gābhasti-h* 'hand' beside Lat. *capiō* '(I) take, grasp', OIr. *cacht*, Lat. *captus* 'captive, captured', Skt. *kapaṭi* 'two handfuls'.

III + III alternating with III + I:

PIE *phakh- ~ *phak'-: Lat. *pāx* 'peace', gen. *pācis*; *paciscō* '(I) make peace' beside Lat. *pangō*, *pepigī* '(I) establish, strengthen, reinforce', Gk. *ptēgnūmi* '(I) strengthen'.

PIE *pheik̂h- ~ *pheik'-: Skt. *piṃśāti* 'decorates', Avest. *paēs-* 'paint, decorate', Lith. *piēšti* 'draw, write', OCS *pišq*, '(I) write', Gk. *poikilos* 'spotted' beside Skt. *piṅgalá-* 'spotted', Gk. *píggalos*, OCS *pěgŭ* 'skewbald'.⁶⁴

64. In roots containing a stop and a sonorant or spirant, the restrictions on stop combinability of course did not hold, so that any stop could, in principle, vary with one of any other series. Even so, in such roots variation is essentially restricted to glottalized and aspirated

2.6.3. *Point-of-articulation restrictions on consonant combinations within the root. Accessive and decessive consonant sequences (distant and contact)*

After application of Rules (a)-(d) above has excluded certain consonant sequences, a number of sequences still remain,⁶⁵ some of which are affected by constraints on combinations of places of articulation.⁶⁶ Using the cover symbols B (for labials), D (dental), G (velar, including its palatovelar and labiovelar modifications), we can enumerate all the theoretically possible combinations of points of articulation within the root (excluding those ruled out by Rule (a)) as follows:

Type A:	1. B + G	Type B:	1. G + B
	2. B + D		2. D + B
	3. D + G		3. G + D

In zero-grade forms of C₁VC₂ roots, these yield the following clusters:

Type A:	1. BG	Type B:	1. GB
	2. BD		2. DB
	3. DG		3. GD

This distribution defines the structure of the root in one essential respect, namely in the ordering of consonants based on their point of articulation. That ordering can be of two types: progression from the front of the mouth to the back (Type A above), and from the back to the front (Type B above). The first type can be called *decessive* (or *introverted*), the second *accessive* (*extroverted*).⁶⁷ In a system with three basic points of articulation, each of the two

consonants:

***seuk^h ~ *seuk^o**:- Lat. *sūcus* 'juice', OE *socian*, Latv. *sūkt* 'suck' beside Lat. *sūgō* '(I) suck'.

***meuk^h ~ *meuk^o**:- Lat. *mūcus* 'moisture, slime', Gk. *mūkēs* 'mushroom', Latv. *mukt* 'sink into swamp' beside Lat. *mūgil* 'fish sp.'.

***merk^h ~ *merk^o**:- Lith. *mérkiu* 'squint' beside OIcel. *myrkr* 'dark', Russ. *morgat* 'blink' (see Stang 1967).

65. I.e. the series combinations I + III, III + I, II + II, III + III. All such combinations are considered admissible by the standard handbooks of Indo-European (Meillet 1938:191ff., Szemerényi 1970:90ff.), which generally consider only combinations of series and not combinations of orders.

66. These constraints are not usually formulated as root-structure conditions. Root-structure constraints are considered only in Magnusson 1967; cf. also Gercenberg 1972:130-38, I. Melikišvili 1980.

67. The notion of accessive vs. decessive consonant clusters was introduced by G. S. Axvlediani in connection with Georgian consonant clusters. He saw it as a general-phonetic regularity which explained historical changes of clusters in languages of various types (Axvlediani 1949:107ff., 334ff.).

ordering types can have three varieties, as shown above. The members of the orderings can be identified as in Table 14, using two pairs of distinctive features, anterior vs. posterior and medial vs. peripheral.

Table 14

Distinctive features	Point of articulation		
	B	D	G
Anterior	+	+	—
Medial	—	+	—

Table 14 shows that in a system with three basic points of articulation, a decessive sequence invariably begins with a [+anterior] segment, while two types of accessive sequence begin with a [—anterior] segment and one with a [+anterior] segment.

Indo-European C₁VC₂- roots show both decessive and accessive orders with two [—medial] consonants, i.e. with maximal articulatory distance between the two consonants. Put differently, labial and velar consonants can combine regardless of the decessive or accessive order of the sequence; both B + G and G + B occur. Examples:

Type A (decessive):

***pheḥh-**: Skt. *paśú-* 'livestock', Avest. *pasu-*, Lat. *pecū* 'livestock', Goth. *faíhu* 'money', OLith. *pēkus*, OPruss. *pecku* 'livestock'.

***phekho-**: Skt. *pácati* 'cooks', Avest. *ham.pačaiti*, Alb. *pjek* 'I bake', OCS *pekq* '(I) bake', Toch. A, B *pāk-* 'cook, bake'.

Type B (accessive):

***ghabh-**: Skt. *gábhasti-* 'hand', Lat. *habeō* '(I) have', Goth. *gabei* 'wealth', OIr. *gaibid* 'takes'.

***khaph-**: Lat. *capiō*, *cēpī* '(I) grasp, catch', Alb. *kam* '(I) have', Goth. *hafjan* 'lift up'.

When one of the consonants is [+medial], i.e. when the distance between the points of articulation is non-maximal (Types A2, A3, B2, B3 above), the distinction of accessive and decessive becomes essential: the decessive sequences B + D and D + G⁶⁸ are permitted, while accessive G + D⁶⁹ is very rare and D +

68. Examples of B + D: ***bhēdh-**: Skt. *bādhate* 'presses, crushes', Goth. *bidjan* 'ask, pray', Alb. *bíndem* '(I) stoop, bend'. ***pḥeth-**: Skt. *páti* 'flies', aor. *apaptat*, Avest. *fra-pataiti*, Hom. Gk. *pétomai* '(I) fly', *eptámēn*, Lat. *petō* '(I) seek, strive'. ***pḥet'-**: Skt. *pāt* 'foot',

B70 is even more restricted. The greater rarity of D + B compared to G + D probably has to do with the fact that D + B has a [+medial] stop as its first element, while G + D has a peripheral, posterior stop as its first element.

Thus the dental point of articulation emerges as marked in regard to these sequences. If no dental is involved, sequences of either ordering are possible, while the presence of a dental limits the ordering in that it favors the decessive ordering. The claim that accessive sequences with non-maximal articulatory distance are extremely rare is a statistical generalization which is not invalidated by the occasional examples of roots showing that structure. It can be confidently claimed that the distribution of consonants in the Indo-European root was limited by consideration of decessive vs. accessive order when certain configurations of the feature of medial/peripheral, i.e. articulatory distance, were involved.

Note the occurrence of **a* vocalism in C₁VC₂- roots with accessive ordering. **a* vocalism is rare in Indo-European roots, and is evidently conditioned by accessive order with an initial velar (contrast the **e* vocalism in the accessive roots **tʰeph-*, **dʰebh-*). The syntagmatic factor of accessive ordering and the velar nature of the root-initial consonant apparently influence the timbre of the root vowel, turning it into the maximally open vowel *a* (see Gamkrelidze 1979).

2.6.4. *The elimination of accessive clusters; 'Brugmann spirants'*

The identification of Indo-European accessive and decessive clusters or sequences makes it possible to understand a number of changes that affected stop sequences in Indo-European branches showing diverse phonetic evolution. Several of them can be reduced to a common tendency to eliminate clusters — as a rule, accessive clusters — formed under zero grade or at morpheme

Avest. *pad-*, Gk. *poús*, Lat. *pēs*, Hitt. *pata-*, Hier. Luw. *pata-*.

Examples of D + G: **dʰegh-*: Skt. *dāhati* 'burns', Avest. *dažaiti*, Alb. *djek* '(I) ignite', Lith. *degù*, OCS *žegq* '(I) ignite', Toch. A, B *śāk-* 'burn', MĪr. *daig* 'fire'. **tʰekʰ-*: Skt. *dāśasyāti* 'serves, worships', Lat. *decus, decet* 'it is fitting', Gk. *dokéō* '(I) judge', Toch. A *tāk-* 'judge'. **tʰekʰ-*: Skt. *tākti* 'hurries', Avest. *tačaiti* 'runs', Alb. *ndjek* 'pursue', OIr. *techim* '(I) run', Lith. *tekù* '(I) run', OCS *tekq* '(I) flow', Toch. B *cake* 'current, stream'.

69. The examples of this type are limited to three roots: **kʰeth-*, **kʰoth-*: Avest. *kata-* 'room, storeroom', Goth. *hēþjō* 'storeroom', Ch.Sl. *koŭlci* 'cella, store, larder', cf. Russ. *kotec* (Vasmer 1964-1973:II.351); the cognate technical terms Gk. *koŭlē* 'vessel', Lat. *caŭnus* 'vessel' (Pokorny 1959:587) may represent secondary derivatives. **kʰath-*: Skt. *śatáyati* 'overthrows', *śātru-* 'victor'; Gaul. *catu-* 'struggle', Olcel. *hǫð* 'struggle' (Pokorny 1959:1534). **gʰedh-*: Skt. *gadh-*, *gádhya-* 'that which is held', OFris. *gadia* 'unite', OCS *godŭ* 'time span, period', Russ. *god* 'year' (Vasmer 1964-1973:I.426, Mayrhofer 1956:I.320-21, Pokorny 1959:423).

70. Only two clear examples of roots of this type are attested: PIE **tʰeph-*: Skt. *tāpāi* 'heats up', Ved. *tāpant-* 'hot', Avest. *tafsən* 'they must be warm', Lat. *tepeō*, OIr. *té* 'hot', OCS *toplŭ* 'warm'. **dʰebh-*: Skt. *dabhnóti* 'harms, deceives', caus. *dambháyati*, Avest. *dab-* 'betray', Hitt. *tepnu-* 'humble, belittle', *tepu-* 'small'.

boundaries.⁷¹ The rules for eliminating clusters are specific to individual languages.

The accessive cluster GD (Type B3 above) which arose at morpheme boundaries underwent various reformations in the various branches. In Hittite, a language which for the most part shows decessive ordering, the accessive cluster is eliminated by assimilation or later anaptyxis:

Hitt. *lutta-* 'window' < **luk-ta-* (PIE **luk-tho-*, cf. OHG, OSax. *lioht* 'light').

Hitt. *galattar* 'liquid, sap, juice of plant', cf. Gk. *gála* 'milk', gen. *gálaktos*, Lat. *lac*, gen. *lactis*. Greek and Latin preserve the accessive cluster, as does Hittite sporadically in *galaktar* (same meaning) (Friedrich 1952:95); cf. the normal preservation of the decessive cluster *-tk-* in Hitt. *ḫatkešnu-*, *ḫatk-* 'press down, oppress'.

Hitt. *uttar* 'word; case, affair' from **uk-tar*, PIE **wekho-* / **ukho-*: Skt. *vāk*, *vac-*, *uk-*, Gk. *wépos*, *épos* 'word', Lat. *uōx* 'voice'.

In such forms the graphic doubling of Hittite probably renders a geminate rather than being a purely graphic means to represent voiceless aspirates going back to Indo-European Series III.

In Indo-Iranian, initial accessive /**kt-*/ is eliminated by loss of the velar: Skt. *turīyaḥ* 'fourth', Avest. *tūirya-* 'fourth' from PIE **khothur-yo-* 'fourth', **khoethw(o)r-* 'four'. Evidence of the velar can be seen in non-initial position: Avest. *āxtūirīm* 'four times' (Szemerényi 1960:80-81, Mayrhofer 1956:I.515).

Sanskrit has another way of eliminating the accessives *-kt-*, *-gd-*: they are replaced by *-kṣ-*, a cluster with a fricative second element and normal for Sanskrit. Examples are:

Skt. *pakṣāḥ* 'wing; side' beside Lat. *pectus* 'chest'.

Skt. *tákṣati* 'makes, crafts; cuts', *tákṣā* 'carpenter', Avest. *tašan-* 'creator' beside Gk. *téktōn* 'carpenter', *téktaina* (cf. Skt. fem. *takṣṇī*):⁷² Mayrhofer 1956:I.468; 1963:II.1.

Skt. *kṣéti*, *kṣiyāti* 'inhabits', Gk. *ktízō* '(I) found a village', cf. *peri-ktí-tai* 'neighbors' and Skt. *pari-kṣít*, etc.

Skt. *kṣaṇóti* 'wounds, beats', OPers. *a-xšata-* 'unharméd', Gk. *kteínō* '(I) kill'.

Skt. *kṣáyati*, Avest. *xšayati* 'rules, owns', Gk. *ktáomai* '(I) obtain', perf. *kéktēmai* '(I) own, have'.

This development, typical of Sanskrit, is due to the inadmissibility of initial stop clusters in Indo-Iranian.

71. For elimination of accessive clusters see Axvlediani 1949:334ff.

72. Kuryłowicz 1973a:97 proposes the reverse development **ks* > Gk. *kt* for these and similar words. However, this requires positing a separate phoneme **ç* for Proto-Greek and a phonetic law **ks* > **kç* > *kt*; and, as Kuryłowicz himself notes, this phonetic law operated only when there was no morpheme juncture between the two phonemes (1973a:98, 1977:205ff.). But on this analysis Skt. *pakṣā-* is unexplained, as are the Hittite cognates *tekan*, *ḫartaga-*, etc.

Accessive [-kt-], [-gd-] can also arise in Sanskrit through metathesis of [-tk-], [-dg-] inherited from Indo-European clusters or distant sequences. These new accessive sequences also change to *kṣ*. The evidence for these changes comes from comparing Skt. *ṛkṣaḥ* 'bear' with Avest. *arša-*, Gk. *árktos* 'bear', Lat. *ursus* (< **orcsos*). The Hittite cognate acc. sg. *ḫar-tág-gán* 'bear' (in KBo VII 14, 5: ...*nu-ut-ta ḫar-tág-gán ma-a-an...*)-iṣ-ki-mi 'and I will ...] you like a bear': Gamkrelidze 1961:275) can be transcribed as [ḫartkan], which shows that the cluster *-tk-* was present in the oldest Indo-European form of the word. Sanskrit, Greek, and probably Latin metathesize this cluster into the accessive *-kt-*, which is subsequently changed to *kṣ* in Sanskrit.⁷³

For Mlr. *art* 'bear' (for the Proto-Celtic form see Hamp 1965b:222) we can assume elimination of accessive **-rkht-* through loss of the velar: **-rkht-* > *-rt-*; cf. the analogous development in OIr. *ro-ort* 'he killed', 3sg. pret. of *org-* 'destroy, kill', which has an exact formal correspondent with *-rkt-* preserved in Hitt. (*para*) *ḫarkta* 'he perished'.

Of analogous origin are Skt. *kṣāḥ*, *kṣmā* 'earth', *kṣámyaḥ* 'earthly', corresponding to Gk. *khthōn*, Toch. A *tkam* 'earth' beside Hitt. *te-e-kán* 'earth', gen. *tagnaš*, loc. *tagan* (Schindler 1967, 1975). The Hittite form represents the full grade of PIE **dheǵh-*, which alternated with the zero grade of **dhǵh-* (Toch. A *tkam*, Hitt. loc. [tkan]). The Greek and Sanskrit forms show the typical Greek-Aryan metathesis to form accessive clusters, initial [**ǵdh-*], [**kth-*] (Gk. *khth-* by assimilation).⁷⁴ These then undergo the regular Sanskrit development to yield initial *kṣ-*.

Accessive [**ǵdh*] is also eliminated in another way in Sanskrit, where it is unnatural in initial position: the *dh* is lost. Cf. Skt. gen. *gmāḥ* (in *divás ca gmás ca* 'of sky and earth': Wackernagel and Debrunner 1930:III.243), *jmā* 'earth' (RV VII, 39, 2: *jmayā* 'on the earth'), parallel to *kṣāḥ*, *kṣmā* above.

In this set of cognates, the metathesis of decessive [**dgh*], [**tkh*] to accessive [*gdh*], [*kth*] is a dialectal phenomenon which unites Greek and Aryan; the subsequent replacement of **gdh* by *kṣ* is a specifically Aryan development in the elimination of accessive clusters.⁷⁵ The same form undergoes analogous changes with loss of the dental in a number of other dialects as well: Toch. B

73. In Greek dialects the accessive cluster is resolved by simplification of *tk* or *kt*: Gk. *árkos*, *árkeios*, *árkēlos*. A number of forms with initial accessive clusters show a prothetic *i* (which cannot be traced back to a laryngeal: Beekes 1969:19): *ikhthūs* 'fish', *iktīnos* 'imperial falcon' (see Schwyzler 1939:I.413). The prothetic vowel is missing in the Armenian cognates: *jukn* 'fish', *c'in* 'falcon' (Hovdhaugen 1968:130).

74. Similar metathesis is attested in historical Greek by *tíktō* '(I) give birth, produce' < **ti-tk-ō* (cf. aor. *é-tek-on*), *dáktylos* 'finger' (possibly from **datkulos*): see Poultney 1976:291.

75. Cf. **duxsi-* 'daughter', posited for Old Persian and reflected in Elam. *du-uk-ši-iš* (Benveniste 1966b:43-48), cf. Avest. *dugədar-*, *duyḡdar-* beside Skt. *duhitā*, Gk. *thugátēr* 'daughter'. An accessive cluster formed when the vowel was lost, and it is simplified in the cognates of other languages as well: Arm. *dustr*, OCS *dŭsti* beside Lith. *duktė*, Goth. *dauihar* 'daughter'.

kem (beside Toch. A *tkam*), Lith. *žėmė*, OCS *zemlja*, Lat. *humus* 'earth'.

In Sanskrit, it was not only the accessive cluster **ḡdh* that was replaced in initial position by *kṣ*. In Sanskrit there are no initial stop clusters; instead we find only the frequent *kṣ*.⁷⁶ Therefore any initial obstruent cluster, other than the common type *st* and *ṣt*, has been replaced by *kṣ* in Sanskrit. This applies to loan words as well as to native Indo-Iranian words. The initial *kṣ* of such words is not a phonetic correspondent to the clusters of cognate words, but rather a replacement for the original cluster. This can be seen from Sanskrit forms such as:

Skt. *kṣú-* 'livestock', *kṣu-mánt-* 'owner of cattle', *puru-kṣú-* 'one who has many cattle', Avest. *fšū-* 'livestock', cf. Skt. *paśúh* 'livestock', Lat. *pecus*. The original **psu-* that can be posited is replaced by *kṣu-*.

An analogous replacement of *pt* by *kṣ* can be posited for *kṣívati* 'spits' beside Gk. *ptúō* '(I) spit', *ptúalon* 'saliva'. There is a parallel replacement of the original cluster by *ṣth*, cf. *ṣhívati* 'spits'.

Cf. also Skt. *kṣáp* 'night', Avest. *xšapan-*, beside Gk. *pséphas*, *pséphos*, *knéphas*, *dnóphos*, *zóphos* 'darkness', Hitt. (*i*)*špant-* 'night' (Goetze 1951:475, 1954:357).

These forms, together with Skt. *kṣam-*, Gk. *khthōn* 'earth' and Skt. *ṛkṣaḥ*, Gk. *árktos* 'bear', point to the origin of Skt. *kṣiṇāti*, *kṣiṇóti* 'destroys' beside Gk. *phthínō* '(I) destroy' (cf. Gk. *kléos áphthiton* 'undying glory' and Skt. *śrávaḥ ákṣitam*) or Skt. *kṣárati* 'flows; flows away, disappears' beside Gk. *phtheírō* '(I) spoil' (cf. *áphthoros* 'unspoiled', Skt. *akṣára-* 'unfading'). Both words go back to an Indo-European root **debh-* / **dbh-* 'harm; shorten; deceive', whose full grade is represented by Skt. *dabhnóti* 'harms, damages; deceives', pass. 'is harmed', Avest. *dab-* 'deceive, deprive', cf. Gk. *atémbō* '(I) harm, deprive, shorten' (Pokorny 1959:240). The forms given above show zero grade of the root, **dbh-*, and full grade of the suffixes. This created an accessive cluster,⁷⁷ which was metathesized to decessive **bdh* (Greek *pth* became *phth* with assimilation, cf. **kth* > *khth* in *khthōn*, above), which in turn was replaced in Sanskrit by the normal *kṣ*.

This account of Skt. *kṣāḥ*, *ṛkṣaḥ*, *kṣiṇāti*, *kṣárati* and Gk. *khthōn*, *árktos*, *phthínō*, *phtheírō* as involving metathesis of an originally accessive cluster and replacement by *kṣ* in Sanskrit removes the need to posit special fricatives ('Brugmann spirants') for the protoforms in order to explain the apparent

76. Initial *ts-* is found in only three words, one of which is an old combination of initial root *s-* with a prefix: *tsárati* 'crawls' < **t-seleti* (Mayrhofer 1956:I.540-41); the other two are connected to the first: *tsáru-* 'crawling animal' and *tsaru-* 'sword handle (in form of snake)' (Mayrhofer 1956:I.541). Initial *ps-* is found in four Vedic words: *psára-* 'joy', Avest. *fsaratu-*, Khotanese Saka *ṣsar-*; Skt. *psāti* 'chews, swallows'; *psu-* 'breath' (in compounds); *psúra-* (unclear meaning; found in the Rigveda): see Mayrhofer 1963:II.388-89.

77. This root is one of the few Indo-European roots with accessive stop ordering.

phonetic discrepancies in the reflexes.⁷⁸ The fricatives reconstructed in 2.4 above were posited on the evidence of regular correspondences; each has its own distinct correspondences; and they cannot be explained as due to combinatory factors. The forms surveyed here give no support for reconstructing special ‘Brugmann spirants’ in addition to those.

78. For a survey of the literature see Gunnarson 1971; also Wright 1965. A morphological explanation using special infixes was proposed by Karstien 1971:256ff.

Chapter Three

The vowel system and the theory of morphophonological alternations. Sonants and laryngeals in Indo-European

3.1. The vowel system and the rise of ablaut alternations in Indo-European

3.1.1. Conditions on the appearance of zero grade

An important source of consonant clusters is zero grade of the root, which was evidently conditioned by accent shifts. A root structure C_1VC_2 -, when in the zero grade caused by a shift of the accent onto the preceding or following syllable, yields a sequence C_1C_2 -, with an accessive or decessive consonant cluster:

***pheth**-: Gk. *pétomai* '(I) fly', OHG *fedara* 'feather', Skt. *pátram* 'wing' beside ***phth**-: Gk. aor. *eptómēn*, *éptato*; *pterón* 'wing'.

***thekh**-: Gk. *tékos* 'child' beside ***thkh**-: Gk. *tíktō* '(I) give birth' < **tí-tk-ō*.

The old Indo-European alternations of full and zero grade are especially clearly observable in roots with initial *s*-:

***segh**-: Gk. *ékhō* '(I) hold, have' : ***sgh**-: Gk. aor. *éskhon*.

***set**-: Lat. *sedeō* '(I) sit', Gk. *hézomai* '(I) sit down' : *-**st**-: Skt. *nīḍá-* 'refuge, haven' < **ni-zd*- < **ni-st*-, Arm. *nist*, Lat. *nīdus* 'nest'.

A striking regularity exhibited by zero-grade forms of roots with two stops is that they include only roots where both stops are of Series III. Proto-Indo-European zero grade with stops is attested only in roots of the type III + III. Clear examples of zero grade in such roots are the following:

III + III roots

PIE ***phekh**- / ***phkh**-: Lat. *pecū* 'livestock, possessions', Goth. *faíhu* : Avest. *fšū-yant-* 'cattle breeder', *fšū-šan-* 'acquiring (having) livestock', Skt. *kṣu-mān-*, *kṣu-mánt-* 'provided with fodder (food)', *puru-kṣú-* 'rich in food, richly giving', Gk. *kteís*, gen. *ktenós* 'comb' (< **pkten-*, cf. Lat. *pecten* 'comb').

PIE ***pheth**- / ***phth**-: Gk. *pétomai* '(I) fly', OHG *fedara* 'feather', Skt. *pátatra-* 'wing' : Hom. Gk. *eptámēn*, *éptato*; *ptēsis* 'flight', *ptéruks*, *pterón*

‘wing’, Arm. *t’ir* ‘flight’, Skt. aor. *apaptat*, Avest. *tāta-* < **ptāta-* ‘falling’ (of rain), cf. Gk. *ptōtós*.

PIE **thekh-* / **thkh-*: Gk. *tékos* ‘kin, clan’ : Gk. *tíktō* < **tí-tk-ō* ‘(I) give birth’.

PIE **khoeth-* / **khoṭh-*: OCS *četyre*, Gk. *téssares* ‘four’ : Skt. *turīya-* < **kturīya-*, Avest. *tūrya-* ‘fourth’.

There are other Indo-European roots with two phonemes of Series III which have full grade with *e* vocalism but show no zero grade:

**thekho-*: OIr. *techid* ‘runs’, *intech* ‘path’, Lith. *tekù*, Latv. *teku*, OCS *tekq* ‘flow, run’.

**theph-*: Lat. *tepidus* ‘warm’, *tepor* ‘warmth’, Skt. *tāpah* ‘heat’.

In the case of **theph-*, the absence of zero grade is due to its accessive sequence of consonants, atypical for Indo-European, which is responsible for the stable *e* grade of the root. In the case of the decessive **thekho-*, it may be connected with the labialized root consonant, which had a tendency not to combine with other consonants in clusters. Compare **khoeth-* ‘four’ above, where an accessive cluster with a labiovelar as first member was resolved in Sanskrit through loss of the first consonant (*turīya-* from **kturīya-*) and in other languages a reduced vowel was later inserted to break up the difficult cluster:¹ **khoṭh-* > **khoeth-*: cf. Gk. *písures* ‘four’, Lat. *quattuor*, Slav. *četyre* (> Pol. *cztery*, Czech *čtyři*).

Another apparent example of the same lack of zero grade because of a labiovelar is **kholekh-* / **kholekh-*: Skt. *kāś-*, *kāśate* ‘be visible, appear’, Avest. *ākasaī* ‘he saw’, *čašman-* ‘eye’, OCS *kažq* ‘(I) show’, inf. *kazati*, *u-kazū* ‘decree, ukase’.

Proto-Indo-European roots containing stops of Series I or II are characterized by a lack of zero-grade forms.² In place of zero grade they have *o* grade, which provides a functional correspondent to the zero grade of III + III roots.

1. This late reduced vowel must be strictly distinguished from the earlier reduced vowels we reconstruct as subsequently yielding *o* vocalism when in full grade. The later reduced vowel, known as ‘Güntert’s schwa’, is a much more recent phenomenon restricted to individual late Indo-European dialects, in particular Italic, Greek (Petersen 1938), and Baltic (Stang 1966:45, 1975:45). Güntert’s schwa usually yields *a*, unlike the original Indo-European reduced vowels, which reconstruct as full-grade vowels with coloring dependent on the adjacent consonants (usually, *o* coloring). But Güntert’s schwa is typologically analogous to the earlier reduced vowel: it arises in order to break up clusters that were non-phonotactic in the individual Indo-European dialects.

While reflexes of the ancient reduced vowel are present in all Indo-European dialects and consequently reconstruct for Proto-Indo-European, Güntert’s schwa can be established only for individual daughter dialects, as an independent development in each.

2. The same can be said for the isolated examples of II + I roots, e.g. **bhak-* ‘share, portion’ (see I.2.6.1n62). This structure was atypical for Indo-European, and therefore our Rule D in Chapter 2 treats it as an impossible stop combination for Indo-European roots.

II + II roots

PIE ***bhegh-** / ***bhogh-**: OIcel. *bága*, *bægja* 'oppose, be opposed' (Gmc. **ē*, see Pokorny 1959:115) : Gaul. *bāgaudae* 'rebels, insurrectionists', OIr. *bágaid* 'he fights', *bág* 'fight, struggle', Latv. *buōztiēs* 'get angry'.

PIE ***bhedh-** / ***bhodh-**: Gaul. *bedo-* 'hole, canal', Lith. *bedù* '(I) dig', Lat. *fodiō* '(I) dig'.

PIE ***dhegho-** / ***dhogho-**: OCS *žegq* '(I) burn, ignite', inf. *žešti*, Lith. *degù* '(I) burn, ignite', Toch. A *tsāk-* 'burn', Lat. *febris* 'fever', Lat. *foueō* '(I) heat, warm up'.

PIE ***ghedh-** / ***ghodh-**: Skt. *gádhyah* 'what is held on to', Goth. *gōps*, OHG *guot* 'good, appropriate', OCS *godŭ*, *godina* 'year'.

PIE ***ghebh-**: Gk. *kephalē* 'head', Goth. *gibla* 'pediment', Toch. A *špāl* 'head'.

PIE ***dhebh-**: Hitt. *tepu-* 'small', *tepu-* 'belittle' : Skt. *dabhnóti* 'harms'. A few Sanskrit forms of this root with zero grade are found: *á-dbhu-ta-* 'surprising', *dabdhá-*, perf. pass. ppl. of *dabhnóti*.³

I + III and III + I roots

PIE ***phet-** / ***phot-**: Hitt. *pedan* 'place', Gk. *pédon* 'soil', Arm. *het* 'track', Lat. *pēs*, gen. *pedis* : Goth. *fōtus*, Hitt. *pata-*, Gk. *poús*, gen. *podós* 'foot'.⁴

PIE ***t'ekh-** / ***t'okh-**: Gk. *deksiterós* 'right', Lith. *dēšinas* 'right', OCS *desnŭ* 'right', Gk. *dékhomai* '(I) accept' : Gk. *dókxa* 'opinion', *dógma* 'decision'.

PIE ***t'ekh-m-**: Skt. *dása* 'ten', Lith. *dēsimts*, OCS *desęti*.⁵

PIE ***khet-** / ***khot-**: Skt. *kadrú-* 'brown', Gk. *kédros* 'cedar' : OCS *kadilo* 'censer', OPruss. *accodis* < **at-codis* 'flue'.

In summary, the clear examples of zero grade in Indo-European roots with

3. Pokorny 1959:240 reconstructs a zero grade for Avestan forms as well (2pl. pres. *dābēnaotā*, *dābāvayaŋ*), but this is not justified by the Avestan graphic rendition of these forms (cf. the root *dābu-*: Gercenberg 1972:36). This casts doubt on the zero grade Pokorny reconstructs for the Indo-European protoforms; cf. the stable *e* in Hitt. *tepu-* and *tepu-*, which corresponds exactly to Skt. *dabhnóti*.

4. The zero-grade forms of this root (Skt. *-bd-*, Gk. *bd*) frequently cited in comparative grammars are found only as a second element in compounds of recent formation, dating to after the voicing of ejectives in the individual daughter languages and showing assimilation of the initial consonant. They cannot be traced to Proto-Indo-European. Examples: Skt. *upa-bdā-* 'footfall', Avest. *fra-bda-* 'front leg', *a-bda-* 'where it is forbidden to step', Gk. *epi-bda* 'day after holiday'.

5. In compounds with ***t'ekhmth-**, which are relatively late formations, the impermissible cluster **t'kh** formed when the vowel was removed. It was resolved by dropping the first consonant from the cluster. This is functionally comparable to breaking up the cluster by inserting a reduced vowel (cf. Russ. *tridcat'* from **tri-dŭseti*).

two stops are confined to the few III + III structures. In all remaining admissible root types with stops, there are no clear examples of zero grade but there are forms with *o grade.

Good Proto-Indo-European examples of zero grade, as with III + III roots, are also found in C₁VC₂- roots where the first consonant is s:

sVC roots

PIE *set'- / *st'-: Lat. *sedeō* '(I) sit', Gk. *hézomai*, Lith. *sėdžiu*, OCS *sěždq* '(I) sit', *sędq* '(I) sit down': Arm. *nstim* '(I) sit down' < *ni-st'yō, *nist*, Lat. *nīdus* 'nest', Skt. *nīḍā-* 'haven, refuge'.

PIE *sek'- / *sk'-: Skt. *sájati* 'adjoins', Mlr. *sén* 'trap, snare', Lith. *sėgti* 'adjoin': Avest. *vohuna-zga-* (*spā*) 'dog trained for blood'.

PIE *seǵh- / *sǵh-: Gk. *ékhō* '(I) have, hold', Skt. *sáhate* 'conquers, defeats', Goth. *sigis* 'victory': Gk. *éskhon* (aor. of *ékhō*), *skhoīmen* (1 pl. opt.), Avest. 1sg. opt. *zaēmā*.

PIE *sekḥ- / *skḥ-: Skt. *á-sak-ra-* 'inexhaustible', Lith. *sėkti* 'fall (of water level)', OCS *isęknqti* 'dry up': Hom. Gk. *ésketo* 'fell' (of water); reduplicated form in Avest. *hišku-* 'dried out', Welsh *hysb*.

PIE *sekhō- / *skhō-: Goth. *saíhan* 'see': OIr. *ro-sc* < *pro-skwo- 'eye'.

Zero grade is also found in roots with the structure CVs-:

PIE *bhes- / *bhs-: Skt. *bábhasti* 'smashes, breaks': Skt. *psáti* 'crushes; devours', Gk. *psáō*, *psaíō* '(I) cut into small pieces'; initial *bhs- is simplified to *s- in the word for 'sand' even in Proto-Indo-European: Gk. *psámathos*, contaminated by *ámathos* 'sand', OHG *samt*, OE *sand*, Lat. *sabulum* 'sand'.

PIE *bhes- / *bhs-: Skt. *bábhasti* 'blows, inflates': Gk. *psúkhō* '(I) blow, breathe', *psukhé* 'breath; soul'.

PIE *khes- / *khs-: Hitt. *kišai-* 'comb', OCS *česq* '(I) comb': Gk. *ksáinō* '(I) comb, scratch'.

These forms represent a fairly complete list of C₁VC₂- root structures with obstruents. They clearly demonstrate the unexpected fact that good Indo-European examples with zero grade are few, and zero grade is phonologically conditioned in roots containing obstruents. Complete loss of the vowel is possible only in the few root types containing only Series III stops and (occasionally) those containing a Series II stop, and in roots with initial or final *s. This general situation finds its explanation in the fact that clusters containing stops of different series (i.e. II + III, I + II) were not permitted. Thus to the constraints on stop combinations in distant sequences in CVC- roots (Rules 1-4 of I.1.3.1 above) we can add additional restrictions applying only to zero grade,

to the effect that stops of different series could not combine in clusters.⁶

Root structures which were phonologically unable to take zero grade show a tendency to use an ablaut grade with **o* vocalism. **o* grade in roots whose consonants could not form clusters is opposed to zero grade in roots whose consonants could form clusters. In individual archaic Indo-European formations, unaccented **o* grade appears precisely under the conditions where zero grade is found in roots whose consonants can form a permissible cluster (see Kuryłowicz 1956).

This functional correlation between zero grade and **o* grade shows that they are phonologically conditioned and in complementary distribution, determined by the root structure. From this we can infer that they were originally functionally identical in Proto-Indo-European roots with obstruents (cf. forms such as Gk. *podós*).

3.1.2. *Weak and strong vowel grades and the original Indo-European vowel triangle i, a, u. The laryngeal phonemes in early Indo-European*

The original functional identity of zero grade and **o* grade makes possible internal reconstruction of the earliest Indo-European patterns of vowel alternations and the ways in which the later Indo-European ablaut mechanism arose. For earliest Indo-European, internal reconstruction establishes two basic grades of root vocalism: the strong grade, i.e. with a vowel, and the weak grade, i.e. without a vowel. Loss of the vowel in the weak grade is connected with a shift of the accent from the root syllable onto a prefixal or suffixal syllable.

The basic canonical root form at this stage must have been C₁VC₂-, where C₁ and C₂ could be obstruents (probably with restrictions on possible combinations), sonorants (*y, w, r, l, m, n*), or laryngeals (H₁, H₂, H₃). The latter were posterior consonants, evidently formed farther back in the articulatory tract than the uvulars. The vowel appeared in two forms, *e* and *a*, of which *e* was the basic and usual vowel in old Indo-European roots while *a* had a much more restricted distribution. The following are relatively unambiguous examples of *a* coloring:

Lat. *caecus* 'blind', OIr. *caech* 'one-eyed', Welsh *coeg-ddall* 'one-eyed', Goth. *haihs* 'one-eyed', Skt. *kekaraḥ* 'cross-eyed'.

Lat. *lēuir*, Gk. *daēr* < **daiwēr*, Arm. *taygr*, OHG *zeihhur*, Lith. *dieveris*, RChSl. *děver* 'husband's brother'.

6. Restrictions confining clusters to consonants of the same manner of articulation are common among the world's languages, found e.g. in North and South Caucasian. In Ubykh and other Caucasian languages, according to Vogt (1963:29), the following principle operates:

(a) Voiced consonants can be followed only by voiced consonants, and voiceless consonants only by voiceless consonants.

(b) In a cluster of two stops, one or both can be glottalized.

Mr. *géc*, Welsh *cainc* 'branch', OIcel. *hár*, OCS *sqkŭ* 'branch', Skt. *śaṅkú-* 'hook; prop, support'.

Welsh *ceinach* < **kasnī* 'hare', Osc. *casnar*, Lat. *cānus* 'gray', OHG *haso*, OPruss. *sasins*, Skt. *śasá-*, Pashto *sōe*, Wakhi *sūi*.⁷

Gk. *aûos* (Hom.), *haûos* (Attic) 'dry', Alb. *thárë* 'dried out', OHG *sōrēn*, OE *sēar*, Lith. *saûsas* 'dry', OCS *suxŭ*, Russ. *suxoj* 'dry', Skt. *śúṣyati* 'dries out'.

Gk. *khén*, Lat. *ānser* 'goose', OIr. *géiss* < **gansī*, OE *gōs*, Lith. *žqsis*, Russ. *gus* 'goose', Skt. *haṁsá-* 'water bird'.

Lat. *nāsum* (OLat.), *nāssus*, OHG *nasa*, OPruss. *nozy*, Lith. *nósis*, OCS *nosŭ*, Skt. *nasā* 'nose'.

Lat. *sāl* 'salt', Gk. *háls*, OIr. *salann*, Arm. *ał*, Goth. *salt*, Latv. *sāls*, Russ. *sol'*, OCS *solŭ*, Toch. B *salıye*, Skt. *sal-ilá-* 'sea' (< *'salty': Thieme 1953).

The fact that *a* quality was extremely limited in Proto-Indo-European forms while *e* quality was usual shows that *a* quality was originally conditioned by combinatory factors which cannot now be defined precisely.⁸ Even if we assume that *a* was an independent phoneme in late Indo-European, along with *e* (and *o*, see Szemerényi 1970), nonetheless for earlier stages internal reconstruction yields a single vowel phoneme V with combinatory variants *e* (the basic, distributionally less restricted variant) and *a* (restricted by conditions which were subsequently lost, bringing about the phonemicization of *a*).

Another source of *a* quality was an adjacent laryngeal H₂: VH₂ yielded aH₂, H₂V yielded H₂a. Examples of *a* from this source are:

Skt. *árjunah* 'white', Gk. *argós* 'white', *argi-* 'white', Lat. *argentum* 'silver', Toch. A *ārki*, Hitt. *ḫarki-*: PIE *H₂ark̑-.

Skt. *āp-* 'water', *dvīpá-* 'island' (< **dvi-H₂p-*), Avest. *āfš*, Hitt. *ḫap-* 'current, stream': PIE *H₂aph-.

Skt. *ánti* 'against, before', Gk. *antí* 'before', Lat. *ante*, Hitt. *ḫant-* 'forehead': PIE *H₂anth-.

Hitt. *ḫašša-* 'hearth', Lat. *āra* 'hearth', Osc. *aasaí* 'in the hearth': PIE *H₂as-.

Lat. *pāscō* 'herd, tend flocks', *pāstor* 'herder', Skt. *pāti* 'herds, guards', OCS *pasti*, Toch. A *pās-*, B *pāsk-* 'guard, watch over', Hitt. *paḫš-* 'guard, watch over': PIE *phaH₂s-.

Lat. *nouāre* 'renew', Gk. *neáo*, Hitt. *newaḫḫ-*: PIE *newaH₂-.

Another variant of V in Proto-Indo-European was *o* quality, conditioned by an adjacent third laryngeal: VH₃ yielded oH₃ and H₃V yielded H₃o:

Gk. *órnis* 'bird', Goth. *ara*, OCS *orilŭ*, Hitt. *ḫaraš*, gen. *ḫaranaš*: PIE *H₃or-.

7. Unless it is related to Gk. *kekēnas* · *lagōoús* 'hare' as 'jumper' (Schwyzer 1939:I.302, Mayrhofer 1952:27, Kuryłowicz 1956:193, note 38).

8. However, see I.2.6.3 above for *ā* vocalism in C₁VC₂- roots; it was probably conditioned by an acccessive sequence with a root-initial velar. Note also that velar stops are found in some of the Indo-European forms with **a* vocalism listed above (cf. Gamkrelidze 1979).

Lat. *opus* 'work, labor', *ops* 'abundance', Skt. *ápaḥ* 'work', Avest. *afnah-vant-* 'wealthy', Hitt. *ḫappar* 'price, cost', *ḫappinant-* 'wealthy': PIE ***H₃oph-**.

Skt. *áviḥ* 'sheep', Lat. *ouis*, Gk. *ówis*, *oîs*, Lith. *avis*, OCS *ovīca*, Arm. *hov-iw* 'shepherd' (Skt. *avi-pālā-*), Hier. Luw. *hawī-*, Hitt. *ḫawa-* 'sheep': PIE ***H₃owi-**.

Gk. *ózos* 'branch', Arm. *ost*, OE *ōst*, Hitt. *ḫaštuir* 'brushwood': PIE ***H₃os-**.

Lat. *dō* '(I) give', Gk. *dídōmi*, Skt. *dádāmi*, Hitt. *daḫḫi* '(I) take', pret. *daḫḫun*: PIE ***t'oH₃-**.

Positing three laryngeals H₁, H₂, H₃ for early Indo-European explains the unequal distribution of the vowels *e*, *a*, and *o*. It also explains the restriction of *a* and *o* to word-initial position and roots which later developed long vowels. The long vowels of the classic Indo-European triad in ***dhē-**, ***t'ō-**, ***sthā-** go back to ***dheH₁-**, ***t'oH₃-**, ***sthaH₂-**.

The phonological influence of the laryngeals on the coloring of an adjacent vowel must have been due to phonological features of the laryngeals themselves. They obviously had posterior articulation, more posterior than the uvular consonants. On typological grounds, these phonemes can be regarded as pharyngeal continuants. The pharyngeal articulation darkened an adjacent vowel to *a*. The *o* coloring imposed by H₃ shows that it was labialized: H^oV yields H^oo, and VH^o yields oH^o. The *e* quality adjacent to H₁ indicates that H₁ may have been palatalized: H̃V yielded H̃e and ṼH̃ yielded eH̃.

Thus the symbols H₁, H₂, H₃ can be rewritten as H̃, H, H^o. Plain H (traditional H₂) was the unmarked member of the triad, opposed to the marked palatalized and labialized laryngeals. The markedness relations are also reflected in the statistical frequencies of the three laryngeals: palatalized H̃ and labialized H^o are much less frequent than the unmarked H.

Secure examples of H̃ before a vowel in native Indo-European roots are Hitt. *ḫekur* 'high place' beside Skt. *ágram* 'high place' and Hitt. *ḫenkan* 'fate', OIr. *écen* 'necessity' (Welsh *angen*), Gk. *anágkē* 'fate' (for possible ***H̃** in roots such as ***H̃es-** 'be', ***H̃et-** 'eat', and others see below). Examples of H̃ after a vowel are Hitt. *teḫḫi* '(I) put', Gk. *títhēmi*, Skt. *dádāhāmi*: PIE ***dheH̃-**; Hitt. *meḫur* 'time', Goth. *mēl* 'time', Skt. *māti* 'measures': PIE ***meH̃-**; Hitt. *šeḫur* 'urine', OIcel. *súrr* 'sour', OCS *syrŭ* 'raw, unripe': PIE ***seH̃-**.

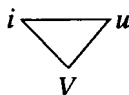
This three-member set of laryngeals provides a structural parallel to the three velar orders — velar, palatovelar, and labiovelar (Gamkrelidze 1960:89ff.; cf. Andreev 1957, where the laryngeals are analyzed as voiceless palatal or velar spirants). This system not only has typological parallels in Abkhaz-Adyghe (Allen 1956) and modern Eastern Iranian dialects (Èdel'man 1973), but in addition is justified by internal structural correlations within the Indo-European sound system.

Thus the vowel phoneme V posited for early Proto-Indo-European appeared

with *e* coloring (its basic variant), with *a* coloring (in occasional cases and adjacent to H), and with *o* coloring (adjacent to H⁰). In addition to V, high vowels **i* and **u* must be reconstructed for early Proto-Indo-European.⁹ They appear in Proto-Indo-European forms with stable vocalism, e.g. Lat. *quis, quid* ‘who’, ‘what’, Osc. *pīs, píd*, OIr. *cid*, Gk. *tīs*, Skt. *kíh, kím*, OCS *čř-to*: PIE **khoi-*; and Skt. *kú* ‘where’, Cret. *ó-pui*, Syrac. *pūs*, Alb. *kur*, Lith. *kuř*, OCS *kū-de*, Lat. *-cubī* (in *nē-cubī, sī-cubī, ali-cubī*), Hitt. *kuwapi* ‘sometime’, *kuwatta* ‘somewhere’, etc.

Hence internal reconstruction for the earliest stage of Proto-Indo-European yields a triangular vowel system with feature oppositions for height (low V vs. high **i* and **u*) and anteriority (anterior vs. posterior):¹⁰

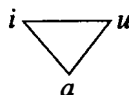
Figure 1



The phoneme V had three phonetic realizations, all of them low vowels: front [æ], central [a], and a back [a] close to [ɔ]. We transcribe these allophones as *e*, *a*, and *o*.¹¹

This system finds a close parallel in the Proto-Semitic vocalic triangle:

Figure 2



3.1.3. The rise of syllabic sonants and the formation of the sonant system in Indo-European. The original vowels **i* and **u* as sonants

For early Proto-Indo-European two basic classes of phonemes must be posited: the consonants proper, including obstruents, the sonorants *y, w, r, l, m, n*, and the laryngeals H₁, H₂, H₃; and the vowels V (with allophones *a, e, o*), *i*, and *u*.

9. For *i* and *u* as original vowels see Kuryłowicz 1956:393 and Szemerényi 1970:129; see also Mel'ničuk 1979.

10. The vowel triangle, with its neutral, front, and back members, corresponds structurally to the three orders of dorsals and laryngeals — neutral (velar), palatalized, and labialized.

11. This Indo-European vowel system is fully consistent with the typological claim that vowel systems with oppositions for two features, height and compactness, are common (Jakobson 1971a; cf. Andersen 1972:1140).

The system became more complex as shifts of the phonemic dynamic stress from one morpheme to another created paradigmatic oppositions in derivation and inflection (see Kiparsky 1973). This led to weakening of the unstressed vowel, hence its reduction or complete loss in the case of roots whose consonants formed clusters of the types permitted in Indo-European.

The Proto-Indo-European forms surveyed above give grounds for assuming that root vowels could drop out only in roots with two Series III stops or with *s* as one of the root consonants. Elsewhere the weak, i.e. unaccented, grade took the form of a non-phonemic extra-short vowel which can be symbolized **ə*. This non-phonemic vowel was a variant of zero, conditioned by the structure of the root in reduced grade.

Thus we must reconstruct both a strong grade with normal stressed vocalism and a weak, or unaccented, grade. Weak grade had two variants, depending on the phonological structure of the root: zero and reduced.

Strong grade: $C_1\acute{V}_1C_2-V_2C_3-$
(In traditional terms, full or normal grade)

Weak grade: $C_1V_1C_2-\acute{V}_2C_3-$
Variants (conditioned by root phonological structure):
a. Zero grade
b. Reduced grade

In roots with sonorants, weak grade generally took the form of reduced grade: a reduced vowel appeared next to the sonorant to give it phonetic support in position adjacent to an obstruent. Using the cover symbol R to represent any sonorant, we have the following possible structures for weak grade with sonorants:

RVC- ~ RəC-
CVR- ~ CəR-

Subsequently the combination of reduced vowel and sonorant produced a syllabic sonorant. Schematically:

əR, Rə > R̥
əy, yə > i
əw, wə > u
ər, rə > r̥
əl, lə > l̥
əm, mə > m̥
ən, nə > n̥

The formation of syllabic sonorants led to the rise of subphonemic correlations between syllabic sonorants and the corresponding nonsyllabic sonorants of strong grade. In forms such as the following:

*t'ey-k̂h- : t'əy-k̂h- > t'i-k̂h-
 *bhew-dh- : bhəw-dh- > bhu-dh-
 *t'er-k̂h- : t'ər-k̂h- > t'r-k̂h-
 *bhen-dh- : bhən-dh- > bhṇ-dh-
 *phel-th- : phəl-th- > phl̥-th-

the sonorants alternate with their syllabic counterparts (*i*, *u*, *r*, *l*, *ṇ*, *ṇ*) in weak grade where there is no vowel. This led to phonemic identity of the two alternants, since syllabic and nonsyllabic sonorants were combinatory variants whose syllabicity was determined by the context.

The formation of these syllabic sonants led to the identification of the reduced variant of weak grade as the zero variant, so that roots with sonorants shared with certain obstruent roots the complete absence of a vowel in weak grade. In weak grade, *lei-kho- yielded *li-kho- and *bheu-dh- yielded *bhu-dh-. This resulted in the well-known late Proto-Indo-European alternations of *ei* and *i*, *eu* and *u*, *er* and *r*, *el* and *l*, *en* and *ṇ*, *em* and *ṇ*. Examples of Proto-Indo-European ablaut alternations in roots with sonants:

Strong (normal, full) grade

ei

Gk. *eîmi*, Skt. *émi* '(I) go'
 Gk. *leípō* '(I) leave'

eu, we

Gk. *peúthomai* '(I) recognize',
 Skt. *bódhate* 'awakens, notices'
 OHG *weban* 'weave'

Gk. *hekōn* (ppl.) 'willing(ly)',
 Skt. *vás-mi* '(I) want',
 Hitt. *wek-mi* '(I) want'

Weak (zero) grade

i

Gk. *í-men*, Skt. *imáh* '(we) go'
 Gk. *é-lip-on* 'left'

u

Gk. *e-puth-ómēn* 'noticed',
 Skt. *bud-dhá* 'awakened'
 Skt. *ubhnāti*, *umbhāti* 'weaves',
 Avest. *ub-daēna-*; Gk. *huphē*
 'fabric'
 Skt. *usánt-* 'desiring', Avest. *usant-*

er

Gk. *kêr* 'heart', Hitt. *kir*
'heart', OPruss. *seyr* 'heart'
Gk. *phérō* '(I) carry', Lat.
ferō, OCS *berq*, Skt.
bhárati, Arm. *berem*

r

Gk. *kardía*, Hitt. *kardiyaš* 'heart'
(gen.), Lith. *širdis*
Skt. *bhr̥-tá-h* (past ppl.)

el

Gk. *amélgō* '(I) milk', Skt.
māṛṣṭi 'rubs', OHG *melchan*,
OE *melcan*, Lith. *mélžu* 'milk'
(inf.)

l

Skt. *mṛ̥ṣṭá-*, Lat. *mulctus* (past ppl.),
Mlr. *mlicht*, *blicht* 'milk'

em

Goth. *qiman* 'come', 1pl. *qemum*,
Avest. *Jamaiti* < **k'oemeti*

m̥

Gk. *bátēn* (aor. of *baínō* '(I) go'),
Ved. *ágan* (aor. of *gam-* 'go'),
gatá- (past ppl.) < **k'oṃ-*

en

Gk. *peîsma* 'rope', *pentherós*
'father-in-law (wife's father)'
(< 'joined by affinal kinship'),
Skt. *badhnāti* 'ties', Goth.
bindan 'tie', Lith. *beñdras*
'companion'

n̥

Skt. *baddhá-* (past ppl.) 'tied'

These phonetic and phonemic changes inevitably led to a split of the consonants into consonants proper and sonants (*y*, *w*, *r*, *l*, *m*, *n*). The sonants had syllabic and nonsyllabic allophones depending on context, while the consonants proper had only nonsyllabic allophones (and the vowels were exclusively syllabic in all positions). Consequently, sonants had the feature value [\pm syllabic], in contrast to consonants proper [$-$ syllabic] and vowels [$+$ syllabic].

These changes produced a major restructuring of the vowel system. The original high vowels *i* and *u* became identified with the syllabic allophones of the sonants *y* and *w*. Hence they acquired the status of sonants, specifically syllabic allophones of sonants which appeared in zero grade. These vowels had not formerly been in alternation with nonsyllabic elements, but were now pulled into the system of sonant alternations, which broke their connection to the class

of vowels.

This reanalysis of original *i* and *u* led in some cases to a secondary formation of strong grade, with V inserted into roots in which *i* or *u* had originally been a root vowel but was now interpreted as a sonant in zero grade. This apparently took place in the parallel markers of the Indo-European locative, **-i/*-ei*. Of these two locative forms, **-i*, which was stressed, is clearly the older and reflects the ancient vowel phoneme **i* in strong grade: Gk. *pod-í*, Skt. *pad-í* 'in the leg', *dat-í* 'in the tooth', *janas-í* 'in birth', Hitt. *nepiṣ-i* 'in the sky', beside the later Slavic *nebes-i* 'in the sky'. Other full-grade forms with the diphthongs *ei* and *eu* corresponding to *i* and *u* in zero grade, often adduced as illustration of the full/zero grade alternation, may well represent later formations from roots with original vowels **i* and **u* which were secondarily identified with syllabic sonants and reinterpreted as zero grade.¹²

3.1.4. The Indo-European laryngeals as sonants

In roots with laryngeals, as mentioned above, the vowel V appeared as *e*, *a*, or *o* depending on the quality of the laryngeal. In weak grade, roots with laryngeals, like roots with sonants, exhibited not zero vocalism but reduced vocalism in the form of an extra-short vowel of unclear quality, *ə*:

CeĤ-	⇒	CəĤ-	ĤeC-	⇒	ĤəC-
CaH-	⇒	CəH-	HaC-	⇒	HəC-
CoH ^o -	⇒	CəH ^o -	H ^o oC-	⇒	H ^o əC-

Like the combination of reduced vowel plus sonorant, the combination of pharyngeal continuant and preceding or following reduced vowel yielded syllabic units opposed to their nonsyllabic alternants as allophones of a single laryngeal phoneme.¹³ Thus reduced grade in roots with laryngeals takes the

12. This finds support in the Indic grammarians' theory of alternations, according to which forms with *i* and *u* were taken as the basic alternation grade and those with diphthongs *āi*, *du* were classified as *guṇa* ('raised', 'accessory') grade. In Indo-European there apparently occurred both reduction of full vowels with the consequent formation of syllabic elements and secondary insertion of vowels into roots with the original vowels *i* and *u*. It is difficult to find evidence for these original vowels, since the new system of derivational and inflectional relations obscured the original distribution of phonemes.

13. A typological parallel for these phonetic properties of the Indo-European laryngeals comes from the Semitic pharyngeals *ħ* and *ʕ*, defined as a voiceless pharyngeal spirant and a laryngealized pharyngeal (Ferguson and Moukhter et al. 1961, Ladefoged 1971:41-42 and Table 24). The voiced pharyngeal influences the quality of adjacent vowels and can be syllabic in certain positions. Specifically, it can be syllabic initially before a consonant, finally after a consonant, and between an initial consonant and a vowel: e.g. in the Beirut dialect of Arabic *ʕallam* 'he learned' (#C__V), *sabʕ* 'seven', *ʕamʕ* 'sing' (C__#), *ʕaraf* 'he acknowledged' (#__C): see Mattson 1911:100-101. For the dual consonantal and syllable-forming nature of the

form of zero grade, with a syllabic correspondent to the nonsyllabic laryngeal of the full-grade form. Syllabic and nonsyllabic laryngeals were thus in complementary distribution as allophones of single phonemes assignable to the category of sonants. These were the correlations proposed by Saussure in his reconstruction of the Indo-European phonemes which he defined as 'sonant coefficients'.¹⁴

The syllabic allophones of the laryngeals provide what is known as *schwa Indogermanicum*, posited on the basis of the correspondence of Sanskrit *i*, Greek *a* (*e*, *o*), Italic *a*, and Balto-Slavic *a*:

Strong (normal) grade	Weak (zero) grade
*dheH-	*dhəH- > *dh̥H-
Skt. <i>dádhāmi</i> , Gk. <i>títēmi</i> , Hitt. <i>teḫḫi</i> '(I) put, place'	Skt. <i>hitá-h</i> (Ved. <i>-dhita-</i> in compounds), Gk. <i>thetós</i> (past ppl.)
*t'oH^o-	*t'əH^o- > *t'̥H^o-
Skt. <i>dádāmi</i> , Gk. <i>dídōmi</i> , Lat. <i>dō</i> '(I) give', Hitt. <i>dahḫi</i> '(I) take'	Skt. <i>á-dita</i> , Gk. <i>dotós</i> , Lat. <i>dātus</i> (past ppl.)
*sthaH-	*sthəH- > *sth̥H-
Skt. <i>tíṣṭhāmi</i> , Doric Gk. <i>hístāmi</i> '(I) place, stand'	Skt. <i>sthítá-</i> , Gk. <i>statós</i> , Lat. <i>stātus</i> (past ppl.)

3.1.5. Development of secondary full-grade forms on the basis of the reduced grade and the rise of the vowel triangle e, a, o

In C₁VC₂- roots with obstruents, there are practically no forms showing weak grade, except for the roots whose phonological structure permitted the formation of zero grade, as discussed above. The lack of weak grade must be due to later changes and secondary appearance of forms with full grade. As shown

voiced laryngealized pharyngeal see also Vergote 1945:72-73; see Keiler 1970:83ff. for Semitic phonetic parallels to the Indo-European laryngeals. Also of typological interest is Kabardian, where, according to Jakovlev 1923, the pharyngeal *ħ* can be a syllable-forming element. These phonetic parallels from different languages show that pharyngeals can be syllabic in some aspects of their behavior, and they serve as reliable typological grounds for reconstructing the Indo-European laryngeals as having both syllabic and nonsyllabic forms.

14. For a bibliographical survey of the laryngeal theory going back to Saussure's *Mémoire*, see Polomé 1965; also Szemerényi 1973.

above, weak grade in these roots could only have had the form of reduced grade with an extra-short vowel of unclear quality which broke up inadmissible non-phonotactic clusters that would have been formed by the root consonants. Unlike roots containing sonorants, in obstruent roots the reduced vowel could not merge with an adjacent consonant to form a syllabic allophone of the consonant. Rather, it was reanalyzed and replaced by a full vowel, generally of *o* quality but occasionally of *e* quality, depending on neighboring phonemes.

A fairly clear example of replacement of a reduced vowel by a full vowel with *e* quality is **nebhes-* from **nəbhés-*: Skt. *nábhaḥ* 'fog, sky', Hitt. *nepiš* < *nepes-*, OCS *nebo*, *nebese*, *nebesi* 'sky', Lith. *debesis*, Gk. *néphos* 'cloud'; for typological comparison, note Hittite forms like *weten-i* 'in the water', with similar vowel harmony.¹⁵

Otherwise, the normal development of the reduced vowel was with *o* quality. This explains the fact that a whole group of roots lacks forms with weak (zero) vocalism and shows *o* grade in functionally equivalent forms. This source of *o* vocalism can be posited for the obstruent roots which systematically lack forms with zero grade (see the lists of II + II and I + III, III + I roots in 3.1.1 above).¹⁶ This is supported by the fact that roots with this *o* vocalism generally lack forms with zero vocalism. Forms with *o* vocalism and no zero grade include the following, which are of considerable antiquity (see Kuryłowicz 1956:280):

Skt. *kákṣā* 'underarm', Avest. *kaṣa-* 'shoulder', Lat. *coxa* 'thigh', OIr. *coss* 'leg', OHG *hāhsina* 'shin': PIE **kheḱhs-*.

Lat. *corulus* 'nut, acorn', OIr. *coll* 'hazelnut tree, nut tree', OHG *hasal(a)*, OLith. *kasulas*: PIE **khos-(e)lo-*.

Lat. *hosti-s* 'guest; alien, enemy', OIcel. *gestr* 'guest', OCS *gostǫ*: PIE **ghos-thi-*.

Skt. *pāti-*, Avest. *paiti-* 'lord, husband', Gk. *pósis* 'master, proprietor' (cf. *des-pótēs*), Lat. *potis* 'able, capable', Goth. *-faþs* (in compounds like *brūþ-faþs* 'bridegroom'), Toch. A *pats* 'husband', Lith. *pàts* 'husband', *pāt* (particle), Hitt. *-pat* 'exactly, (the) very' (particle): PIE **photh-*.

Lith. *núogas* 'naked', Latv. *nuògs*, OCS *nagŭ*, Lat. *nūdus*, Goth. *naqaþs*, OIr. *nocht*, Gk. *gumnós*: PIE **nok'o-*.

Occasionally, and especially in Greek, the reduced vowel appears as *u* under

15. There may have been another development leading to the rise of *o* vocalism: the influence of adjacent sonants. Posttonic *e* adjacent to a sonant may have given rise to *o*, resulting in paradigmatic alternations as in Gk. *légomen* 'they spoke' beside *légete*, *patér* 'father' beside *apátōr* 'fatherless'; *dotér* 'giving' beside *dōtōr*, *phrēn* 'soul, mind' beside *áphrōn* 'mindless', etc.: see Mańczak 1960.

16. Prior to the change of **a* to *o* we must posit 'syllabic' obstruents **aC* which subsequently changed into sequences of *o* + C. This process can be compared to the later change of syllabic *r*, *l*, *m*, *n* (which phonetically consisted of *a* plus sonant) into sequences of full vowels and *r*, *l*, *m*, *n*.

the influence of a following labialized phoneme, which transfers its labialization to the vowel:

***nek'o- > *nək'o- > *nuk'o-**

An example of the same type is IE ***nekʰo-th-**: Hitt. *nekut-* 'evening'. The ***o** grade from the original reduced vocalism is represented by Lat. *nox*, gen. *noctis*, Goth. *nahts*, OCS *noštī* 'night'. In Gk. *núks* 'night', *-u-* is due to the influence of the following labialized ***kʰo**.

Another example is ***wokʰo-**, apparently with secondary ***o** vocalism from a reduced vowel in weak grade: Lat. *uōx* 'voice', Skt. *vāk* 'word', Avest. *vāxš*. Normal grade, with *e* vocalism, is shown by Gk. *épos* < *wépos* 'word'.

All of the above instances of *o* vocalism can be traced to replacement of a reduced vowel in zero grade by a full vowel with *o* quality. This is why they lack forms with zero vocalism even though in terms of root structure zero grade should have been phonetically possible for them. Apparently for such stems there were additional restrictions that precluded the appearance of zero grade. It is noteworthy that as a rule they contain back consonants ('gutturals'). The development of a full vowel with *o* quality from an original reduced vowel may have been conditioned by velar stops. An example is Gk. *gumnós* 'naked', whose root vowel *u* shows the clear influence of the originally following labiovelar.

In summary, the sources of *o* quality in early Proto-Indo-European included not only the labialized laryngeal H₃ but also replacement of a reduced vowel by a full vowel of *o* quality in roots with stops. The same reduced vowel, which served as a vocalic support to consonants in clusters, merged with an adjacent laryngeal or sonant to form syllabic segments. This process created the class of sonants, which subsumed the laryngeals (or 'sonant coefficients') in Indo-European. These two developments of ***ə** with obstruents and sonants (including laryngeals) suggest that *o* did not occur in roots with sonants in Proto-Indo-European of this period.

There were two developments that brought the vowels *e*, *o*, *a* into phonemic contrast. One was the rise of an *o* vowel adjacent to H₃ and in place of a reduced vowel in obstruent roots (as well as in grammatical morphemes under certain conditions: cf. particles such as ***kʰom**, ***som**, endings like ***-os**, ***-om**). The other was the development of an *a* vowel adjacent to H₂ and in certain other phonetic environments. As a result, the vowels *e*, *o*, *a* acquired the status of independent phonemes.

The removal of *i* and *u* from the category of vowels to that of consonants transformed the original vowel system without making substantial changes in the internal correlations among the elements of the system. The two-degree vowel triangle of early Indo-European (Figure 3) changed to another two-degree tri-

angular system (Figure 4):

Figure 3

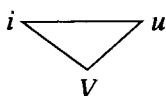
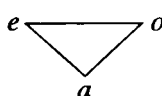


Figure 4



Herer *e* and *o* were opposed to *a* as closed to open vowels, and *e* was opposed to *o* as vowels of high vs. low tonality. The only difference between the two vowel systems was the degree of openness in the compact-diffuse opposition.¹⁷

3.1.6. The dephonemicization of the laryngeals; their merger into a single laryngeal phoneme. Influence of laryngeals on vowel quantity

The phonemicization of the vowels necessarily entailed the dephonologization of the three laryngeals \hat{H} , H , and H^o and their merger into a single laryngeal (the 'sonant coefficient'),¹⁸ which can be represented by the generic symbol H (see Gamkrelidze 1960:90, 1968). It is this Proto-Indo-European laryngeal phoneme that is reflected in Hittite as the voiceless velar spirant $h(h)$. Merger of the

17. Since it is not possible to determine the relative chronology of phonologization of vocalic allophones and fusion of reduced vowels with sonants to yield syllabic sonants, it cannot be ruled out that there was a stage of Indo-European — after the phonologization of vocalic allophones and before the rise of syllabic sonants — which had a classic five-vowel triangle with three degrees of height and two of frontness:

Figure 5



An essential point that emerges from the internal reconstruction of the Indo-European sound system at its various stages of development is that there is no chronological level at which a monovocalic system can be reconstructed (see Schmitt-Brandt 1967:117). The typological reality of monovocalic systems has been debated in the recent linguistic literature: see Jakobson 1957a, Hockett 1958:94, Szemerényi 1967, Halle 1970, Kuipers 1960, 1968, 1970, Allen 1964, Kacnel'son 1958, Pulleyblank 1965, Gazov-Ginzberg 1974:71-72, Aronson 1969, Roberts 1972:190-200, Kumaxov 1973, Palmaitis 1979a, b. (See, however, Rasmussen 1974:5ff. for an argument that Sanskrit had a monovocalic system with the single vowel phoneme /a/, where *i* and *u* were syllabic variants of /y/ and /v/, and *e* and *o* were diphthongs /ay/ and /av/. But even on this interpretation there are two vowel phonemes, short /ä/ and long /ā/.)

18. This view of the evolution of the laryngeals cancels the debate about whether Indo-European had one laryngeal phoneme or several (see Beekes 1969:271-74, *contra* Szemerényi 1967). The question reduces to one of the exact chronology of the stage of Proto-Indo-European for which the laryngeals are being posited.

laryngeals was the natural result of the development of the phonemically opposed vowels *a, *e, *o, since the laryngeal qualities that had originally conditioned the vowel qualities became redundant once the vowel qualities became independent. The laryngeal qualities were now allophonic, conditioned by the quality of the adjacent vowel.

There is reason to assume that the labialized H^o had begun to merge with the unmarked H even earlier. This is because labialization could easily have been transferred to a following vowel, which would thereby have appeared as *o:

$$H^oV > Ho$$

(for typologically comparable labialization of vowels adjacent to labialized consonants in Caucasian languages see Gamkrelidze 1960:90). In addition, in some cases the labial component of a labialized laryngeal acquired the status of an independent phonemic segment:

$$H^o > Hw$$

A number of Proto-Indo-European forms (Martinet 1953a:254ff., 1955, 1957, Hamp 1955, Cowgill 1965:178-79, Polomé 1965:33-36) illustrate the latter development:

Umbr. *purdouitu*, Falisc. *douiad*, OLat. *duim*, Lith. *daviaũ* '(I) gave', *dovanà* 'gift', Latv. *dāvana* 'gift', OCS *davati* 'give' (see Schmalstieg 1956), Ved. *dāvāne* 'give', 1sg. perf. *dadáu*, Avest. *dāvōi*, cf. Cypr. Gk. *dowenai*:¹⁹ PIE *t'oH^o- > *t'oHw-.

Skt. *jajñáu* 'recognized', Lat. *nōui*, OE *cnēow* (*cnēwan*) (cf. Gk. *agno(w)eîn*): PIE *k̑'n-oH^o- > *k̑'n-oHw-.

Lat. *lauō*, *lāuī*, Gk. *lóō*, *louō* '(I) wash', Hitt. *lahuwait* 'pours': *loH^o- > *loHw-.²⁰

The H that developed from H^o could subsequently influence the quality of the adjacent o , changing it to a just as original H had. This explains the Indo-European roots with a laryngeal which show o grade beside a : cf. Lith. *dovanà* (with o from a) and the parallel Cypr. Gk. *dowenai*; Lat. *lāuī* beside Gk. *lóō*; Lat. *nāuus* 'zealous' (MLat. *gnāuus*) beside Lat. *nōui* (aor. from *nōscō* < *gnōscō* 'recognize, apprehend'); and others (Gamkrelidze 1960:90).

An analogous explanation can be given for a number of roots with long *ē that have a non-root *y in cognate forms. The *y may be a reflex of palatalization of a laryngeal following the *e (see Diver 1959, Polomé 1965:31, Puhvel 1960:53ff., Risch 1955):

19. But see Cowgill 1964:354-55ff.

20. According to Thurneysen 1921:194ff., every Indo-European long -ō has a parallel form with -ōu (cf. also Hirt 1921:I, §56; Thumb and Hauschild 1959:II, §527, 292).

***dheH-** > ***dhē-** / ***dhēi-**:

Skt. *dhā-* in *dādadhāti* 'places, sets', *dhāyate* 'places for oneself', Latv. *dēju, dēt*, Lith. *demì, dest*, OCS *dějō*, Hitt. *daitti* '(you) put'.

***reH-** > ***rē-** / ***rēi-**, cf. Skt. *rāḥ* 'thing, estate', *rāyāḥ, rayí-*, Avest. *raēš*, Lat. *rēs* (Szemerényi 1956).

After the phonologization of vowels, the formerly independent laryngeals *H* and *H* became palatalized and unpalatalized allophones of the single Proto-Indo-European laryngeal. The allophonic distribution was determined by the adjacent vowel:

Hitt. *šeḫur* 'urine', Olcel. *súrr* 'sour', OCS *syrŭ* 'raw, unripe': PIE ***seH-**.

Hitt. *meḫur* 'time', Goth. *mēl* 'time', Skt. *māti* 'measures': PIE ***meH-**.

Hitt. *paḫḫaš-* 'guard', Lat. *pāstor* 'herder', Skt. *pāti* 'guards': PIE ***phaH-**.

Hitt. *naḫḫan* 'worship; fear', OIr. *nár* 'fearful': PIE ***naH-** (see Puhvel 1965:86ff.).

3.1.7. *o* vocalism as originally a variant of weak grade; the rise of *o* as a grade in late Indo-European ablaut alternations

The development of the reduced vowel into syllabicity of an adjacent laryngeal or sonorant which was in an allophonic relationship to the nonsyllabic variant requires *o* grade to have originally been a development of the reduced vowel in root structures with obstruents but not with sonorants. And in fact, in the oldest Indo-European formation types, *o* vocalism in roots with sonorants is found only in isolated cases, which can be explained as assimilation to an adjacent labial. Ordinarily, such roots show *e* or zero grade, the latter going back to the original reduced grade with *ə*. The *ə* would have been susceptible to the influence of an adjacent labial, occasionally developing into a full vowel with *o* quality in these forms as well (cf. Walde 1924).

It is significant that ***o** grade is absent from an Indo-European formation as ancient as ***k^her-t'-**, ***k^hər-t'-** > ***k^hṛ-t'-** 'heart' (Szemerényi 1970a:515-533):²¹

***k^her(-t'-)**

***k^hṛ-t'-**

Gk. *kêr*

Attic Gk. *kardīā*, Ion. *kradiē*

Goth. *haírtō*

Lat. *cor*, gen. *cordis*

OPruss. *seyr*

OIr. *cride* < **kridian* < **k^hṛt'yom*

E. Lith. dial. acc. *šėrdį*

Lith. *širdis*

Arm. *sirt* < **k^hert'-i*

OCS *srŭdīce*

Hitt. *kir* (*ki-ir*)

Hitt. gen. *kardiyas*

21. For Skt. *hārd-i* 'heart', Avest. *zərəd-*, we must assume secondary contamination with a ***-t'** derivative of the root ***g^her-**, Skt. *hārdi* 'stomach of Indra' (RV, Book 9), cf. Gk. *khordē* (Szemerényi 1970a:519).

Another ancient Indo-European noun base, **k̑her-* 'head; horn' shows phonologically conditioned *o* vocalism as well as the regular ablaut grades **k̑her-* and **k̑hər-* > **k̑hṛ-*:

<i>*k̑her-</i>	<i>*k̑hṛ-</i>
Gk. <i>kéras</i> 'brain'	Gk. <i>kár, kárē</i> 'head'
Lat. <i>cerebrum</i> 'brain', <i>ceruus</i>	Skt. <i>śṛṅga-</i> 'horn'
'deer' (< 'horned')	OE <i>horn</i> < Gmc. <i>*hornaz</i> ;
OHG <i>hirni</i> 'brain'	OE <i>heorot</i> 'horn'
	Lat. <i>cornū</i> 'horn'

In this root, **o* vocalism appears only where a suffixal element containing the labial sonant **w-* has been added. In such instances the reduced vowel did not blend with the sonant to yield a syllabic sonant, but was phonologized into a vowel *o* under the influence of the labial:

**k̑her- + -w- > *k̑hər-w/u- > *k̑hor-w-:*

Gk. *korudós* 'lark sp. with crest', *kórus* 'helmet', Hom. *korússetai* 'stands on end', *kórumbos*, *koruphḗ* 'top', *korúptō*²² 'butt; hit with head or horns'; Slav. **korw-* > OCS *krava*, Pol. *krowa*, Russ. *korova*, Lith. *kárvė* 'cow'.

Another ancient Indo-European base is **k̑'en-w-* 'knee' (Lat. *genū*, Hitt. *genu*), with the zero-grade form **k̑'n-eu-* (Goth. *kniu*, cf. Skt. *-jñu-*, Avest. *-šnu-*, Gk. *-gnu* in *prókhnū* < **prógnu*, *gnúks* 'on the knees'). In weak grade it took the form **k̑'ən-w-*, which underlies the reconstructed **k̑'on-w/u-*, with **o* vocalism under the influence of the **u*: Gk. *gónu*, *gounós* < **gonwós*, Skt. *jānu*.

Analogous interactions must be posited for the ancient Indo-European stem **t'ər-w-* / **t'r-eu-* / **t'ər-w/u-* > **t'or-w/u-* 'oak; tree':

**t'ər-w-*: OIr. *derucc*, Welsh *derwen* 'oak', OIcel. *tjara*, OE *teoru*, *tierwe*; OCS *drěvo* 'tree', Lith. *dervà* 'pitch'.

**t'r-eu-*: Goth. *triu* 'tree', cf. Gk. *dru-* in compounds (*dru-tómos* 'woodcutter', etc.), *drumá* 'forest', Alb. *dru* 'tree'.

**t'or-w-*: Gk. *dóru*, *dourós* < **dorwós*, Skt. *dāru*, Hitt. *taru* 'tree'.

Another ancient example of the same kind of structure is **mər-w-* > **morw-* 'ant': OIr. *moirb*, Lat. *formīca*, Avest. *maoirī-*, Sogd. *zm'wrc*, OIcel. *maurr*, Gk. *múrmōs*, *múrmēks*, *búrmāks*, Arm. *mrjiwn*.

Early Indo-European stems with sonants but no labials, when they have zero-grade formations, generally lack forms with *o* grade (except for later formations). Examples of this large group are the following:

22. Gk. *kórsē* 'head' is evidently based on an ancient form *kor-* with *o* vocalism.

***bhendh- / *bhəndh- > *bhŋdh-**

Hom. Gk. *peĩsma* ‘moorage; mooring line’ (Odyssey 10.167); *pentherós* ‘wife’s father’, Skt. *bándhuḥ* ‘relative’, *bandhāti* ‘ties’, Lith. *beĩdras* ‘companion’.

***bhenġh- / *bhənġh- > *bhŋġh-**

Skt. *bahú-* ‘numerous; dense’, Gk. *pakhús* ‘fat, thick’.

***bherġh- / *bhərġh- > *bhŋŋh-**

Arm. *-berj* ‘top’ (*erkna-berj*), *barjr* ‘high’, Hitt. *parku-* ‘high’, Toch. A, B *pärkā-* ‘rise, ascend’, OHG *berg* ‘mountain’, Avest. *bərəzi-* ‘high’, Skt. *bṛhánt-* ‘high’.

***bheudh- / *bhəudh- > *bhudh-**

Gk. *peúthomai*, Skt. *bódhate* ‘is awake, notices’; Gk. *eputhómēn*, *pépusmai*, Skt. *buddhá-* (past ppl.).

***bheugh- / *bhəugh- > *bhugh-**

Gk. *pheúgō* ‘(I) run’, aor. *éphugon*, perf. *pépheuga*, Lat. *fugiō*.

***t’eukh- / *t’əukh- > *t’ukh-**

Lat. *dūcō* ‘(I) lead’ (OLat. *doucō*), Goth. *tiuhan*, OHG *ziohan*; Lat. *ductus*.

***t’eiġh- / *t’əiġh- > *t’iġh-**

Gk. *deíknūmi* ‘(I) show’, Goth. *gateihan*,²³ Osc. *deíkum* ‘dicere’; Skt. ppl. *diṣ-ṭá-*, Lat. *dictus*, Skt. *diṣṭi-* ‘direction, indication’, Avest. *ā-diṣti-* ‘indication’, Lat. *dictiō*.

***t’ens- / *t’əns- > *t’ŋs-**

Lat. *dēnsus* ‘dense’; Gk. *dasús* ‘thick, dense’, Hitt. *daššuš* ‘strong’.

***k’oel- / *k’əl- > *k’ol-**

Gk. *délear*, gen. *deléatos* ‘food’; Lat. *gula* ‘throat’, Russ. *glotať* ‘swallow’, Czech *hlt-*, cf. Lat. *glutiō* ‘(I) swallow’.

23. The cognate Goth. *taikns* ‘sign’ (Pokorny 1959:189) deviates from the others in its consonant correspondences (in showing Goth. *k* instead of the expected *h*); it is the result of Germanic changes and does not give grounds for reconstructing a parallel phonologically irregular form with two ejectives (cf. Rule C, I.2.6.1 above), ***t’eiġh-**, for Indo-European.

***k'enH- / *k'ənH- > *k'ŋH-**

Gk. *génesis* 'origin', *genésthai*, OLat. *genō* '(I) give birth', OIr. subjunctive *-genathar*; Skt. *jātá-ḥ* 'born', Lat. *nātus*, Gaul. *-gnātus*, fem. *gnātha* 'daughter', OIcel. *kundr* 'son'.

***k'enH- / *k'ənH- > *k'ŋH-**

Lith. *žénklas* 'landmark', Goth. *kunnan* 'know', Lith. *žinaū*, *žinóti*, Latv. *zināt* 'know'.

***k'erH- / *k'ərH- > *k'ṛH-**

Gk. *gérōn* 'old man', Skt. *járant-* 'old, worn-out', Oss. *zæronð* 'old'; Lat. *grānum* 'grain' < *k'ṛ-n-, Skt. *jīrná-* 'old', OIr. *grán* 'grain', Lith. *žirnis*, Latv. *ziṛnis* 'pea', OPruss. *syrne* 'grain', OCS *zrīno*, Goth. *kaur̥n* 'grain'.

***gherdh- / *ghərdh- > *ghṛdh-**

Goth. *bigairdan* 'gird', *gairda* 'belt', Toch. B **kerciyi* 'palace', Skt. *grhá-* < *gr̥dha- 'dwelling', Avest. *garəda-* 'cavern as dwelling of devic beings'.

***k'oer- / *k'oər- > *k'oṛ-**

Goth. *-qairnus* 'mill', OIcel. *kvern* 'millstone'; Skt. *gurú-* 'heavy', Gk. *barús*, Lat. *grauis* 'heavy', Latv. *dziṛnus* 'millstone', Lith. *gīrnos* (pl.) 'millstone', cf. OCS *žrūnovŭ* 'mill'.

***ghoel- / *ghoəl- > *ghoļ-**

Gk. *thélō* '(I) wish', OCS *želěti*, *želati* 'wish', OIcel. *gildra* 'snare', Gk. *phalízei* · *thélei* (Hesychius).

***ghoer- / *ghoər- > *ghoṛ-**

Gk. *théros* 'heat of summer', Arm. *Jer* 'warmth', Skt. *ghṛṇá-* 'heat', *ghṛṇóti* 'shines, throws light', Lat. *formus* 'warm'.

***khoer- / *khoər- > *khoṛ-**

Gk. *téras* 'sign', Lith. *keriù* 'enchant', *kēras* 'magic', OCS *čara*, Russ. *čara* 'spell, charm'; Skt. *kṛṇóti* 'makes', ppl. *kṛtá-*, *saṁ-kṛt* 'once', Osc. *petiro-pert* 'four times', OIr. *cruth* 'form, image', Welsh *pryd-* < *khoṛ-tu- 'form, image'.

***men- / *mən- > *mŋ-**

Lat. *meminī* '(I) remember', Lith. *menù* '(I) think', *mėnas* 'art', Hitt. *mema-* 'speak'; Skt. *matá-* 'deliberate, well-considered', Gk. *autó-matos* 'automatic' ('self-acting', 'self-willed'), Lat. *commentum* 'invention', Lith. *mintis* 'thought', OIr. *der-mat* 'forgetting', Goth. *munan* 'think'.

***phərḱh- > *phṛḱh-**

Skt. *pr̥cchāti* 'asks', Avest. *pərəsaiti* 'asks', Lat. *poscō* '(I) ask, demand', OIr. *arco* '(I) ask'.

***-sther- / *-sthər- > *-sthṛ-**

Gk. *astér* 'star', Lat. *stēlla* < **ster-l-*, Mlr. *ser* 'star', Goth. *stairnō*; Skt. instr. sg. *stṛbhīḥ*, Avest. dat. *stərəbyō* 'star'.

***thel- / *thəl- > *thl̥-**

Toch. A, B *täl-* 'carry', pret. A *cacäl*, B *cāla* (*c* < *t*'), Lat. *tollō* '(I) lift' < **thl̥n-*; Lat. *lātus*, past ppl. of *ferō* '(I) carry', Gk. *tlātós* 'patient', Goth. *þulan* 'endure, be patient'.

***ther-H- / *thər-H- > *thṛ-H-**

Gk. *teírō* '(I) wipe, rub', Alb. *tjer* '(I) weave', Lat. *terō* '(I) wipe, rub'; Lat. *trītum* 'ground up', Lith. *tiriù, tirti* 'investigate', OCS *ŭrq* '(I) rub, wipe'.

***wəlkhō- > *wł̥khō-**

Skt. *vṛka-*, Gk. *lúkos*, Goth. *wulfs*, Lith. *vilkas*, Alb. *ulk* 'wolf'.

Thus *o* vocalism was originally a phonetic development, a variant of weak grade and hence functionally equivalent to zero. At some stage in the development of the Indo-European alternations it became an independent ablaut grade, opposed to zero grade proper and normal grade (the old strong grade). It could of course have become part of the ablaut alternations only after its phonetic conditioning had been lost, resulting in the morphophonologization of **o*. This would in turn have led to the penetration of **o* grade into morphological structures that were paradigmatically opposed to those with **e* (**a*) and zero vocalism.

The morphophonologization of **o* vocalism is responsible for the fact that a number of productive Indo-European structures of relatively late origin, such as the reduplicated perfect, the causative, the deverbial noun, etc., have **o* grade,

unlike the other forms in their derivational paradigms. They are due to the rise of **o* grade and its generalization to certain paradigmatic structures.

This morphophonologization of **o* vocalism broadened its sphere of usage, so that it now appeared in a number of paradigmatic innovations typical of late Indo-European. The resultant unified paradigm further obscured the phonetic and phonological conditioning of **o* vocalism, which by now appeared in contexts that had once phonologically precluded *o* coloring. Only internal analysis of Indo-European root structure reveals evidence of the original phonetic conditioning of **o* and its original association with particular phonological structures. The late spread of morphophonological **o* grade is especially clear in causatives, perfects, and thematic nominal formations.

Examples of perfects, where **o* vocalism appears in reduplicated forms of roots containing sonants:

Skt. 3sg. perf. *jajāna*, Gk. *gégona* 'was born', cf. zero grade in Skt. 1sg. *ja-jñ-é* 'I was born', 3pl. *jajñúr*, Gk. **gégamen*, *gegaós* (Schwyzer 1939:I.767, 769), OIr. *ro-génar* 'I was born' (**ge-gn-*).

Gk. 1sg. *mémona* 'I think, want' beside zero grade in *mémamen*, *memaós*, perf. imper. *memátō*, Skt. perf. *ma-mne* 'thought', cf. Hitt. *mema-*, Luw. *mammanna-* 'say', Goth. *man* 'I think', cf. also zero grade in cognate perfects from the same root (Kuryłowicz 1964: §24, 79).

Skt. 1sg. perf. *cakāra*, 3sg. *cakāra* from *kar-* 'make, do': PIE **khoer-*, 1pl. *cakrma*.

Skt. 1sg. perf. *véda* 'I know', Gk. *oída*, Goth. *wait* (cf. OCS *vědě*) beside zero grade in 1sg. Skt. *vidmá*, Gk. (Hom.) *ídmēn*, Goth. *witum*.

Gk. 1sg. perf. *léloipa* 'left', Lat. *liqui* < **loikhoai*, Skt. *riréca*, Goth. *laihv* id. Gk. *dédorka* 'looked', Skt. *dadárśa* id.

**o* grade is conspicuously lacking in perfects with the sequence *eu* — possibly due to dissimilation — in contrast to roots with *ei*, *en*, *em*, etc. This shows that **o* grade was originally phonologically conditioned in the perfect; and this in turn shows that **o* grade is a relatively recent development in the perfect, formed by morphophonologization of **o* vocalism and its spread to verbal structures which earlier had zero grade (cf. Kuryłowicz 1956: §3-30.258-59). Cf. Greek perfects with **e* vocalism from verbal forms of Proto-Indo-European origin: *peúthomai* 'I am convinced', perf. *pépusmai*; the phonologically similar root **bheu-* lacks **o* grade: Skt. *bhávati* 'is, originates', Avest. *bavaiti* 'originates', Gk. *phúō* 'I produce', perf. *péphūka*; *phúomai* 'I become', Lat. *fuī* 'was'.²⁴

**o* grade in the perfect singular forms can also be seen in the Hittite *-hi* conjugation, which probably has the same origin as the perfect: Hitt. *šagahhi* 'I know', 1pl. *šekuēni*; Hitt. *arhi* 'I attain', 1pl. *erueni*; Hitt. *kank-* 'hang' beside

24. Gk. *phōleiós* 'den, burrow' (cf. Pokorny 1959:147) is evidently not related to this root.

Lat. *cunctor* '(I) linger, vacillate'; cf. alternations like *salv-* ~ *sēlv-* in Gothic verbs (see Kammenhuber 1980:35ff.).

**o* ablaut grade is also typical of the Indo-European causative, which may be historically connected to the perfect formations. Causatives too must have had zero vocalism; their **o* grade is a relatively recent phenomenon. Together with iterative-causative forms like **loukhoyelo-*, relics like **lukheyelo-* are preserved; there are 18 of them in the Rigveda (Kuryłowicz 1964:277): *rucāya-* beside *rocāya-* 'throw light' (Kuryłowicz 1956:86; cf. Hitt. *lukki-* 'shine', which may have a similar interpretation: Cowgill 1972, *contra* Hoffmann 1968), *ukšāya-* 'strengthen', *sūdāya-* 'make tasty' (Kuryłowicz 1956:93), etc. (see Bammesberger 1980).

The penetration of *o* grade into causatives can be illustrated by the following forms, with suffix *-*eyelo-* ~ *-*oyelo-*:

Lat. *mulgeō* 'I milk', Lith. *málžyti*, *málžau*.

Lith. *bauginti* 'frighten' (the Greek cognates from *pheúg-* lack *o*-grade forms).

Oldcel. *teygja* 'lead', OE *tīegan* < **taugian* (**o* vocalism is absent from all the forms of this root cited above).

Goth. *kannjan* 'make known, notify', OE *cennan*, OHG *ar-kennen* (cf. the **o* vocalism of forms like OCS *goritŭ* 'burns': Kuryłowicz 1965a).

**o* ablaut grade becomes especially productive in thematic nominal formations. Virtually every root can form a thematic nominal with **o* vocalism. **o* grade is obviously a relatively late phenomenon in these forms. To judge from the relic forms with zero vocalism, **o* must have replaced an earlier zero grade here. The spread of **o* into thematic nominals is comparable to the formation of the perfect with **o* vocalism.²⁵ The very ancient Proto-Indo-European thematic derivation with zero-grade roots is important here: e.g. **yuk'-om*, Hitt. *yugan*, Skt. *yugá-*, Gk. *zugón*, OCS *igo*, Lat. *iugum* 'yoke'. Other nominals of this type have already generalized **o* vocalism as the counterpart to **e* grade.

Gk. *tókos* 'kin' (beside *e* grade in Gk. *tékos* 'child'); Gk. *pókos* 'fleece' (*e* grade in *pékos* 'fleece').

Gk. *toĩkhos* 'wall', Goth. *daigs* 'dough' (*e* grade in Gk. *teĩkhos* 'wall').

Gk. *gómos* 'cargo' (*e* grade in Gk. *gémos* 'load' beside *génto* < **gem-to*, etc.).

Gk. *-phorós*, Skt. *-bhara-ḥ*, Avest. *-barō* 'bearing' (from Gk. *phérō*, Skt. *bhārāmi* 'I carry').

Lat. *forus* 'deck', OHG *barre* 'log', Russ. *zabor* 'fence'.

Gk. *dómos* 'house', Skt. *dāma-ḥ* 'house, dwelling', Lat. *domī* 'at home'.

Gk. *thorós* 'semen', Skt. *dhārā* 'stream; semen', Mlr. *dáir*, deverbial noun from *dar-* 'fertilize'.

OLith. *navas* 'new', OCS *novŭ* (*e* grade in Gk. *né(w)os*, Hitt. *newaš*).

25. Cf. the nominal origin for the Indo-European perfect formations suggested by Hirt 1921:IV and Kuryłowicz 1964:62.

Gk. *gónos* (masc.) 'birth', Skt. *jána-h* (gen. *jánasya*) 'clan', Avest. *zana-* 'people; human race' (cf. Gk. *génos*, neut., 'clan', Skt. *jánaḥ*, gen. *jánasaḥ* 'clan', Arm. *cin* 'birth', Lat. *genus* 'clan').

Gk. *borós* 'voracious', Lat. *carni-uorus* 'carnivorous', Skt. *aja-gará-* '(serpent) which devours goats'.

Gk. *pólos* 'axis (fulcrum)', Lat. *collum* 'neck, throat', OIr. *cul* 'carriage', OCS *kolo* 'wheel'.

Skt. *kāra-* 'doing', masc. 'affair, deed' (cf. above for the vocalism of this root).

Gk. *loipós* 'superfluous', Lith. *pālaikas* 'remaining', *laikas* 'time', Latv. *laiks* 'time'.

Lith. *laūkas* 'field', OHG *loh* 'shrubbery', Lat. *lūcus* 'glade, forest', Skt. *loká-* 'world, space'.

Gk. *nomós* 'pasture, dwelling', Alb. *nëmë* 'curse' (beside Gk. *némos*, neut., 'place of pasturage').

OHG *rōz* 'weeping', Lith. *raudà* 'weeping', Skt. *rudāti* 'cries'.

OCS *sněgŭ* 'snow' < **snoigh^{oo}-s*, Lith. *snaigala* 'snowflake', Goth. *snaiws* 'snow' (cf. zero grade in Hom. Gk. *nīphás* beside *nīphóeis* 'snowy').

Gk. *rhóos*, Cypr. *rhówos* 'current', OCS *o-strovŭ* 'island', Skt. *sravát-* 'current'.

Gk. *stoīkhos* 'row, line', Alb. *shtek* 'entry, passage', Lith. *staigà* 'suddenly'.

Gk. *tónos* 'tension', Lith. *tānas* 'swelling, tumor'.

Gk. *oīkos* 'house', Lat. *uīcus* 'village', Skt. *veśá-* 'neighbor; settlement, village' (beside *i* vocalism in *viś-*), OPruss. *wais-pattin* 'housewife'.

In individual Indo-European dialects *o* grade extends to forms of clear earlier zero grade with suffixed *-*tho-*:

Gk. *phórtos* 'load, burden', Skt. *bhṛ-tá-h* 'brought (ppl.)', Av. *bərate-*.

Gk. *mortós* 'mortal', Lat. *mortuus* beside Skt. *mṛ-tá-h* (Thieme 1952:31).

Gk. *khórtos* 'court, yard', Goth. *gards* 'house' beside Lat. *hortus* 'yard', Osc. *húrz* (see Pokorny 1959:442).

Among the late formations with **o* vocalism are forms with suffixed *-*mo-*: Gk. *oīmos* 'strip, path', Skt. *éma-* 'passage', root **eili-* 'go', Gk. *eīmi* 'I go'.

OHG *leim* 'clay', Lat. *limus* < **loimos* 'mud'; Gk. *kōmē* 'village' < **koimā*, OIr. *cóim*, Goth. *haims* 'village', Latv. *sàime* 'family', Lith. *káimas* 'village'.

OPruss. *gorme*, Lat. *formus* 'warm', Ger. *warm* beside *e* grade in Gk. *thermós* and Arm. *jerm* 'warm, hot'.

In addition to these late paradigmatic derivations, **o* appears in isolated nominal forms such as **dhwor-*: Lat. *forēs* 'double door', OIr. *dorus*, Goth. *daúr*, OHG *tor* 'door', OCS *dvorŭ* 'door', Alb. *derë* 'door', Skt. *dvārah* 'door', cf. Russ. *dver'*; beside **dhur-* with regular zero grade: Gk. *thúra* 'door', Arm.

dur- ‘door’, Skt. *dúr-* ‘door’ (acc. pl. *dur-áh*).²⁶

The same **o* appears in IE **k̑wōn-* ‘dog’: Gk. *kúōn*, Lith. *šuo*, Skt. *śvā*.

**o* is also reconstructed for **en(o)m̑* ‘name’, a word whose structure is not entirely clear: Gk. *ónoma*, Skt. *nāma*, Hitt. *la-a-ma-an*, Lat. *nōmen*. There is also *o* in the late dialectal word **mori-*, attested only in the western Indo-European languages: OIr. *muir*, Goth. *mare*, Lith. *mārė*, OCS *morje* (Stang 1972), Russ. *more* beside Lat. *mare* ‘sea’.

3.1.8. The rise of lengthened grade in the Indo-European ablaut system

In addition to normal grade with **e* (or occasionally **a*) vocalism and the zero and **o* grades derived from it, an ablaut grade with a long vowel — lengthened or tense grade — can also be reconstructed for Proto-Indo-European. This grade is evident in paradigmatic oppositions such as Gk. nom. sg. *patēr* ‘father’ beside acc. sg. *patéra*; Skt. acc. sg. *dātāram* ‘giving, one who gives’ beside loc. sg. *dātāri*; Gk. *dōtēr* beside gen. *dōtēros*; *téktōn* ‘builder’ beside gen. *téktonos*; OE *nōse* ‘foothill’ (*ō* < **a*) beside *nasu* ‘nose’ (< du. **nāsu*), cf. OCS *nosŭ* ‘nose’, etc. For alternation of normal and long grade in verb forms cf. Lith. 1sg. *ėdmi* ‘I eat’, OCS *jamŭ* < **ēmŭ* < **ēt’-mi*, Arm. *utem* (< **ōt’-*), Lat. *ēdimus*, Goth. *ētum*.

In these ablaut relations, every short vowel was opposed to a long vowel. This produced a quantitative opposition of vowels, expressed in a phonemic opposition in the feature of length. Together with the triangular system of Figure 6, an analogous subsystem of long vowels must be posited for late Indo-European (Figure 7):

Figure 6

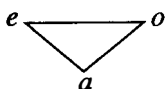
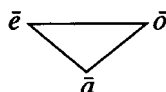


Figure 7

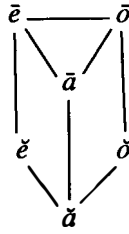


Taken together, these vowel subsystems can be presented as a triangular prism with a vowel at each corner, as shown in Figure 8 below.

The rise of the long vowels was connected with a number of phonetic and phonological positional transformations of the original short vowels. The long vowels that arose in this way were phonemicized when their contextual conditioning factors were lost, and subsequently became opposed to their short correspondents to produce autonomous ablaut grades. Long grade subsequently expanded beyond its original contexts to other ablaut positions. The result was a

26. Cf. the lack of *o* grade in the structurally identical nominal form **ǵhwer-*: Gk. *thēr* ‘beast’, Lat. *ferus* ‘wild’, Lith. *žvėris* (masc.), OCS *zvěřŭ* ‘wild beast’.

Figure 8



complex ablaut system, formed in late Proto-Indo-European times, which opposed lengthened grade to zero and normal grades.

The phonetically and phonologically conditioned development of long vowels from originally short vowels can be assumed to have begun in a restricted group of Proto-Indo-European structures. The main such context was athematic noun stems, which had the short vowels *e, *o, and occasionally *a as their thematic markers preceding the inflectional endings. These vowels underwent compensatory lengthening when certain endings were lost under certain phonetic conditions.

When noun stems ending in non-stops (nonsyllabic *-r* (*-l*), *-n*, *-m*, *-y* (*-w*), *-H*, as well as *-s*) took the *-s* subject marker for the active class (the old nominative case for nouns of the active class), the sequence *-VR-s* or *-Vs-s* was created. The ending *-s* was then lost, triggering compensatory lengthening of the preceding short vowel (or of syllabic *i* or *u*). The result was a long vowel and no nominative ending *-s*, contrasting with forms that had short vowels and the ending. Synchronically, there was contrast between the two types of nominative forms. Examples of thematic stems with short vowels and *-s* nominative are:

PIE *Howi-s: Skt. *áviḥ*, Gk. *oîs* < *owis 'sheep', Luw. *ḫawi-š*.

PIE *ek̑hwo-s: Lat. *equus*, Skt. *ásvaḥ*, Gk. *híppos* 'horse'.

PIE *k̑enu-s: Skt. *hánu-ḥ* 'chin', Gk. *génus* 'chin', OIr. *gi(u)n* 'mouth', Goth. *kinnus* 'chin'.

PIE *Hop-s: Lat. *ops* 'abundance', cf. Hitt. *ḫappar* 'cost, price'.

PIE *nok̑oth-s:²⁷ Lat. *nox*, gen. *noctis* 'night', Gk. *núks*.

PIE *sneigho-s: Lat. *nix*, gen. *niuis* 'snow' (cf. Gk. acc. *nípha*).

In contrast to these forms, *CVC*- roots with velars or dentals as their second consonant formed a sequence *-ŶC-s* before the ending *-s* of the nominative in the common gender; this sequence changed to *-ŶC-s*:

PIE *wok̑ho- + *-s* > *wōk̑ho-s: Lat. *uōx* 'voice', Avest. *vāxš* 'word', Skt. *vāk* 'word', gen. *vācáh*.

27. *nok̑oth-s has a cluster of two consonants followed by the nominative ending *-s*; the cluster is responsible for its difference from *uōx*, *rēx*, cited below, which have long vowels.

PIE ***reḱ-** + **-s** > ***rēḱ-s**: Lat. *rēx* 'king', Skt. *rāṭ* 'king'.

PIE ***phe/ot-** + **-s** > ***phē/ōt-s**: Lat. *pēs*, gen. *pēdis*, Dor. Gk. *pōs* 'foot', gen. *podó-s*, Skt. *pāt*, gen. *padāḥ* 'foot'.

PIE ***nephoth-** + **-s** > ***nephōth-s**: Lat. *nepōs* 'grandson', gen. *nepōtis*, Skt. *nāpāt* 'grandson'.

PIE ***phaḱh-** + **-s** > ***phāḱh-s**: Lat. *pāx*, gen. *pācis* 'peace'.

In these forms vowel length arose for phonetic reasons before **-C-s**, where **C** was a dental or velar stop. (Similar principles for positionally created length can be observed in Indo-European metrics.) The **C-s** clusters were simplified in the individual daughter dialects, although the vocalic length was preserved in nominative forms. Greek and Latin show similar developments of the clusters with loss of a preceding dental and preservation of *s*, while Sanskrit preserves the stop and loses the *s*: see Lat. *pēs*, etc. 'foot' above. Unlike Greek and Latin, Sanskrit also shows the same pattern of simplification where the first consonant was a velar: see Lat. *uōx*, etc. 'voice', Lat. *rēx*, etc. 'king' above.

In stems with final non-syllabic sonants, length arose before the sequence **-R-s** that formed in the nominative case. The **-s** following a nonsyllabic sonant was lost in Proto-Indo-European times. The rise of length in the preceding vowel can be ascribed to compensatory lengthening when the final spirant was lost. This explanation for length in sonant-final stems was proposed by Szemerényi (1970:109ff.); it is confirmed by many Indo-European nominal forms belonging to the old common gender:

Skt. *mātā* 'mother', Gk. *mētēr* (acc. *mētéra*), Lat. *māter* 'mother', Lith. *motė* 'woman': PIE ***māther-s** > ***māthēr-Ø**.

Skt. *pitā* 'father', Gk. *patēr* (Gk. *eu-pátōr* 'good father'), Lat. *pater*, OIr. *athir*, Toch. B *pācer*: PIE ***ph₁ther-s** > ***ph₁thēr-Ø**.

Skt. *bhrātā* 'brother', Gk. *phrētēr* (Ion.), *phrátēr* (Att.), Lat. *frāter*, Toch. B *procer*: PIE ***bhrāther-s** > ***bhrāthēr-Ø**.

Skt. *duhitā* 'daughter', Gk. *thugatēr* (cf. acc. *thugatéra*), Osc. *futír*, Lith. *duktė*, Toch. B *tkācer*: PIE ***dhugh₁-ther-s** > ***dhugh₁-thēr-Ø**.

Skt. *svāsā* 'sister', Arm. *k'oyr*, OIr. *siur*, Lat. *soror*, Lith. *sesuō*: PIE ***swesor-s** > ***swesōr-Ø**.

Skt. *dātā* 'one who gives; bearer (of letter)', Gk. *dōtōr* (cf. *dōtēr*), Lat. *dātor*: PIE ***t'oH₃-ther-s** > ***t'oH₃-thēr-Ø**.

Skt. *nā* 'person, man', Arm. *ayr*, Gk. *anēr* 'person, man', Alb. *njeri* 'person, man', Welsh *ner* 'hero', OIr. *ner* 'wild boar': PIE ***Hner-s** > ***Hnēr-Ø**.

In vocatives, which originally had no ending, the vowel is short as expected: Gk. nom. *patēr* but voc. *páter*; nom. *phrátēr* but voc. *phráter*; nom. *dōtēr* but voc. *dōter*; etc.

The examples just above have stem-final ***-r**. Examples of ***-n** stems include:

Skt. *śuvā* 'dog', Gk. *kúōn*, Lith. *šuō* 'dog', OIr. *cú*, beside zero grade in Skt. gen. *śúnaḥ*, Gk. gen. *kunós*, OIr. gen. *con*: PIE ***ḱhwon-s** > ***ḱhwōn-Ø**.

Skt. *ásmā* 'stone; sky', Gk. *ákmōn* 'anvil', Lith. *akmuo* 'stone': PIE ***(H)ak̑hmōn-s > *(H)ak̑hmōn-Ø**.

Lat. *homō* 'person', Goth. *guma* 'person': PIE ***(dh)ǵh(o)mon-s > *(dh)ǵh(o)mōn-Ø**.

Gk. *khiōn* 'snow', Avest. *zyā* 'winter', Arm. *jiwn* 'snow', Lat. *hiems* 'winter': PIE ***ǵhyom-s > *ǵhyōm-Ø**.

The few examples with final *-i* and lengthening of the preceding vowel include Skt. nom. sg. *sákhā* 'friend, companion', gen.-abl. *sákhuyh*, Avest. nom. sg. *haxa*, cf. Greek formations like *Lētō* (gen. *Lētoūs*), *peithō* 'conviction' (Thumb and Hauschild 1959:II: §272.53; Schwyzler 1939:I.479). The Indic and Avestan forms point to original nominatives in ***-ōi**, with subsequent loss of the *-i* (analogous to the loss of *-r* and *-n* in Indo-Iranian and Baltic, mentioned above). The ***-ōi** in turn goes back to IE ***-ōi-s**, with the *-s* ending of the subject case for active nouns.

Examples of laryngeal-final stems before *-s* include the following Proto-Indo-European cognate set, in which the *-s* is subsequently lost and the vowels or syllabic *i, u* undergo compensatory lengthening:

Gk. *gunē* 'woman', Skt. *gnā* 'wife of god', Arm. *kin*, OIr. *ben*, OCS *žena*: PIE ***k'o(e)naH₂-s > *k'o(e)nāH₂-Ø**.

The nouns with active subject case ending *-s* include stems in long ***-ī**, reflected by masculines and feminines going back to the old active class: Skt. *devī* 'goddess', PIE ***t'eiwīH-s > *t'eiwīH-Ø**; *strī* 'woman', PIE ***sriH-s > *sriH-Ø**.

Examples of stems in ***-s** before the ending ***-s** include PIE ***Hausos-s > *Hausōs-Ø**: Skt. *uṣāḥ* 'dawn', Avest. *uṣā*, Gk. *ēōs*, *héōs* (Aeol. *auōs*), Lat. *aurōra* 'dawn'. Cf. also Latin forms like *honōs*, *flōs*, Gk. *aidōs* (Szemerényi 1970:159ff.); also Skt. *candrāmāh* 'moon', *apsarāh* 'female water nymph'.

Long *ō* in the nominative masculine and feminine of comparative adjectives has the same origin:

PIE ***mek̑'-yōs**: Lat. *maior* 'greater' (from PIE ***mek̑'-yos-s**), cf. OLat. acc. *mel-ios-em* with short *ō*.

PIE ***sen-yōs**: Lat. *senior* 'elder' (from PIE ***sen-yos-s**): Szemerényi 1970:109ff.

This type probably also includes the nominative case of ***mūs** 'mouse': Gk. *mūs* (with long *ū*, cf. short *ǔ* in the other cases: *muós*), Skt. *mūś*, OIcel. *mús*, cf. OCS *myšŭ*. Another example is nominative ***nās** 'nose', from ***nas-s**.

Neuters in *-s*, whose subject case did not take the *-s* ending, predictably show short stem vowels:

PIE ***k̑'enos** 'clan': Lat. *genus*, gen. *generis*, Gk. *génos*, gen. *géne-os*, Skt. *janas-*, gen. *jānas-aḥ*.

PIE ***nebh-es** 'sky': Gk. *néphos* 'cloud', Skt. *nábhas-* 'sky, fog', Hitt. *nepiš*, gen. *nepišaš* 'sky'.

3.1.9. Long vowels in neuter nominals. Nominal stem extensions as markers of the inactive noun class

A special type of the neuters, which reflect an old class of inactive nouns, includes stems with long vowels in the nominative-accusative case (the old inactive case). One of the clearest examples is the Proto-Indo-European word for 'heart', **k̑h̑ēr* (nom.-acc.), **k̑her-t'*:- Gk. *kē̄r*, *kardía*, *kradiē*, Hitt. *kir*, loc. *kardi*; OPruss. *seyr* (= **sēr*), Lith. *širdis* (Szemerényi 1970:110; cf. Saussure 1922). This word had a zero ending in the nominative-accusative (in contrast to the active class, which had *-s*), and its long vowel arose in Proto-Indo-European times through compensatory lengthening due to loss of the final **-t'* in word-final position:

**k̑her-t'* > **k̑h̑ēr*

The **-t'* was evidently a root extension for neuter stems; analogous neuter stems will be investigated below.

This process is phonetically similar to the compensatory lengthening upon loss of final *-s* described just above. In the oblique cases, where **-rt'*- was not word-final, it is preserved intact. The result was a paradigmatic alternation of two stems, **k̑h̑ēr*- and **k̑h̑r-t'*-. Subsequently the alternation was sometimes eliminated and one of the alternants generalized to the whole paradigm (cf. Hom. Gk. *kē̄r*, *kē̄ros* on the one hand, and *kradiē*, *kradiēs* on the other). Goth. *haírtō*, gen. *haírtins* shows *ē* vocalism throughout the paradigm; cf. zero vocalism in Lat. *cor*, gen. *cordis*, OCS *srŭdŭce*, Lith. *širdis*, acc. *širdį* (beside eastern dial. *šerdis*, acc. *šėrdį*). The ancient Indo-European paradigmatic alternation is most clearly represented by Hitt. nom.-acc. neut. *kir* 'heart', gen. *kardiyaš*, loc. *kardi*, dir. *karta*.

Another clear example of the same type in Anatolian is evidently **ser* 'up, top' (cf. OHitt. *šer-šet* 'its top' in the meaning 'for it', as in §95 of the Laws: *šer-šit-wa šarnikmi* 'I will compensate for it'; a later variant is *šer-wa-šši šarnikmi*) and **sṛ-k-u* 'high' (Hitt. *šarku*-; for other derivatives of **sar*- in Anatolian see Laroche 1959b). **sēr* apparently goes back to the nominative-accusative with loss of word-final **k* and compensatory lengthening of the preceding vowel, while *šarku*- comes from the oblique forms, where **k* was preserved before a following syllabic element plus a further vowel.

A stem extension consisting of a stop can also be distinguished in other neuters — the old inactive class. A prominent example is Sanskrit neuter stems which differ from their cognates in other Indo-European branches in having distinctive endings which can be described as characterizing this class of neuter nouns:

Skt. *ásṛk* (attested once in the Rigveda: *ásṛg*, 164, 4), gen. *asnáh* 'blood' (AV

5, 5, 9), instr. *asná* (AV 5, 5, 8), Hitt. *ešhar* 'blood', gen. *ešhanaš*, Lat. *aser* 'blood', Latv. *asins* 'blood'.

Skt. *yákr̥t* 'liver' (AV 10, 9, 10), gen. *yaknáḥ* (RV 989, 3), Pashto *yīna* < **yaxna-*, Pers. *jigar*, Avest. **ha-yākana-*.

Gk. *hēpar*, gen. *hēpatos*; Lat. *iecur*, gen. *iecinoris* (from **iecinis*; cf. also the later *iecoris*: Szemerényi 1956, Schindler 1967), cf. Arm. *leard*, OIcel. *lifr* 'liver' (Benveniste 1935:8ff., Schwyzler 1939:I.518).

Preservation of the neuter stem extensions **-k̥* > *-g/-j*, **-th* > *-t* in Skt. *ásrk* and *yákr̥t* was evidently favored by their position following syllabic sonants.²⁸ After non-syllabic consonants, the same sounds were lost, with compensatory lengthening, in Indo-European.

The oblique form without *-t-* in Skt. *yaknáḥ* goes back to the Indo-European forms with regular absence of the extension. On the other hand, Gk. *hēpar*, *hēpatos* show the **-th-* extension in the oblique cases, confirming the antiquity and Proto-Indo-European status of Skt. *-t-* in *yákr̥t*.²⁹ Note also OArm. *leard*, gen. *lerdi*, with *-rd-* and later paradigmatic leveling.

Apparently no daughter dialect has preserved the original Indo-European pattern of paradigmatic alternations in such roots; they have undergone various paradigmatic levelings in historical times. The paradigms preserve only the ancient Indo-European principle whereby the *-r* and *-n* of what is known as heteroclitic inflection were found in direct and oblique cases respectively. The distributional regularity of the original stem extensions has been destroyed.³⁰

28. Position after a syllabic sonant also explains the preservation of final *-s* in the accusative ending **-ṇ-s*, as opposed to loss of the nominative ending *-s* after a nonsyllabic sonant: see the forms discussed above (the analysis assumes later generalization of the accusative plural ending **-ṇ-s* in thematic stems and forms with syllabic *-i* and *-u*). In contrast, a final *-s* has disappeared in the genitive plural ending **-ōm*, which goes back to **-om-s*, i.e. **-om* + plural marker **-s*; here the final *-s* is predictably lost after a nonsyllabic sonant, with (compensatory) lengthening of the preceding vowel. This proposed archetype for the genitive plural ending entails uniform relations between the singular and plural markers: the plural was formed by addition of the plural ending **-s* to the singular. Cf. the accusative endings singular **-ṇ* and plural **-ṇ-s* from earlier **-ṇ-s*. We also have a genitive singular marker **-om* (cf. Hitt. *-an* in the animate, or common, gender: *šīunan* 'of god') and a plural marker **-om-s* > **ōm*; for details see below.

29. Lat. *iecur* goes back to **iecurt* and *cor* to **cord* (see Ščerba 1974:108). For the possible connection of Gk. *-t-* in heteroclitic nouns to suffixal *-t-* in Sanskrit *yákr̥t* 'liver', *śákr̥t* 'sewage' see also Arbeitman 1976. Arbeitman considers the morphological type in *-t-* relatable to the word for 'name': Hier. Luw. *atimanza* beside Gk. *ónoma*, gen. *onómatos*. Note, incidentally, the Lydian nominative-accusative neuter ending *-d*: *mruvaad* 'stela', *qelad* 'field', etc. (Neumann 1961:405, Gusmani 1964:168, 181).

30. Comparable, functionally regular, sonant alternations must be posited for *l* and *n* as well. They must be assumed for the word for 'sun', **swel-* / **swen-*: Skt. *súrya-*, Gk. *ēēlios*, *aēlios*, *hēlios* (< **awēlios*), Lat. *sōl*, OIr. *súil* 'eye', Goth. *sauil*, Lith. *sáulė*, Latv. *saule*, Avest. *xvāng* (gen.) < **swen-s*, Goth. *sunnō*, OCS *slŭnŭce* (Vaillant 1950). Of the functional alternant stems in *-l* and *-n*, one is preserved in some dialects and the other elsewhere, as a consequence of elimination of *-l/-n* alternations (in contrast to *-r/-n* alternations, for which evidence is preserved within paradigms in a number of languages).

The word for 'water' must also be reconstructed with a stem extension that triggered length of the stem vowel. The word is reflected in Gk. *húdōr*, gen. *húdatos* < **ut'ntos*, Hitt. *watar*, gen. *wetenaš*, Umbr. *utur* 'water', instr. *une* < **udni*, Goth. *watō*, gen. *watins*, OE *wæter*, Oicel. *vatr*, *vatn*, OHG *wazzar*. The Greek gen. *húdatos* < **húdn̥tos* points to an old form with a *-*th*- extension, which was lost word-finally in the nominative-accusative after nonsyllabic -*r*- to trigger compensatory lengthening of the stem vowel:

***w(e)t'or-th** > ***w(e)t'ōr** > Gk. *húdōr*;

cf. zero grade in ***w(e)t'-ŋ-th-(os)**, Gk. *húdat-os*. In the attested Indo-European forms without -*t* (Hitt. *watar*, *wetenaš*, etc.), paradigmatic leveling generalized the nominative-accusative form with its regular loss of -*t*.

The existence of a stem extension in the word for 'water' is also evident in the Sanskrit cognate, which appears as neuter *udaka-* < **ud̥n̥ko-*: the Rigveda has nom.-acc. neut. *udakám* < **ud̥n̥kom* beside the usual neut. *udan-* with a stem in *-*on* (Thumb and Hauschild 1959:II.42, Grassmann 1873:252). Ancient evidence for the -*t*- extension in the oblique cases can also be seen in the directive case of *watar*, *wetant-a*³¹ (beside the later *weten-a*, KUB XXX 34 III 10, the product of paradigmatic leveling).³²

That loss of a final stop, and specifically -*t*, after a nonsyllabic sonant is phonetically possible can be shown on the basis of historical Indo-European languages, specifically Hittite and Greek. At an early stage, Hittite loses final -*t* after -*n*: cf. neut. *human* 'all' beside gen. *humantaš*, neuter participles in -*nt*- such as *adan* 'eaten', *pan* 'going' (beside common gender *panza* [pant-s]). Analogous processes are attested in Greek, e.g. nom.-acc. neut. *pān* 'all' beside gen. *pantós*, neut. ppl. *phéron* from **pheront-*, etc.

The stem extensions *-**t'**-, *-**k'**-, *-**th**- form neuter noun stems, i.e.

31. E.g. in the Instructions to Temple Servants (KUB XIII 4 III 46-47): *ma-aḫ-ḫa-an-ma MI-[a]n-za ki-i-ša na-aš-ta pa-aḫ-ḫur ku-it A.NA GUNNI (47) a-aš-zi na-at-[kán] u-e-da-an-da SIG5-in ki-eš-ta-nu-ut-tin* 'and when night comes, also quench the fire remaining in the hearth well with (lit. 'in') water'; for the directive in -*a* with the same function see Laroche 1970. Cf. also the similar directive case form *uddanta* (KUB XXX 10 I 18ff.) from Hitt. *utar*, gen. *uddanaš* 'word, thing, deed'.

Some Hittite forms in *-*r-t* like *uddar* were reanalyzed as plurals (they are old neuter collectives); for the same development of *-*nt* collectives into plurals (e.g. the Tocharian plural in -*nt*) see Benveniste 1935, 1955. For the Hittite -*ar* type of *paḫḫuwar* 'fire' (KUB VII 6 II 11), a doublet of *paḫḫur* 'fire', cf. Toch. B *puwar*, pl. *pwāra* (Winter 1965a:192-93, q.v. for Bartholomae's reconstruction **pawōr* 'fire').

32. Evidence for this -*r-* in Hittite also comes from the so-called infinitive (or supine) in -*wanzi* (from older *-*want-i*): *šešuwanzi* 'sleep', *tiyawanzi* 'put, place'. These forms can be subsumed under a single paradigm with the infinitive in -*uwar* (*šešuwar*, KUB XV 15 I 4; *tiyawar*, KUB XXII 72 II 61): nom. sg. -*uwar*, oblique -*uwant-*, the source of loc. -*uwant-i* (Laroche 1970), with -*uwanzi* showing the regular prehistoric assibilation of *t* before *i*. For the forms in -*uwar* we must reconstruct an older *-*wart-*, with regular loss of the final -*t* after a nonsyllabic sonant (and lengthening of the preceding vowel).

members of the ancient Indo-European inactive noun class. They were a sort of exponent of this class, marking its members as inactives. Thus certain stems were marked for membership in the inactive class; the active forms were unmarked.

An interesting example of this relationship is PIE **nēr* 'man', which evidently goes back to a nominative active **Hner-s*: Gk. *anēr* 'husband', Skt. *nā* 'man', Osc. *niir*, Welsh *ner* 'hero', Arm. *ayr* (cf. acc. **Hner-m*: Skt. *nāram*, Gk. *anéra*; gen. **nr-os*: Ved. *nāras*, Gk. *andρός*). The marked, inactive form of the same root may be represented by a stem extended with **-th*, reconstructible (Pokorny 1959:765) on the evidence of Skt. *sū-nṛtā* 'life force', OIr. *sonirt* 'strong', *sonairt* 'strong', Welsh *hy-nerth* 'strong', OIr. *nert* 'courage; army', Oss. *Nart-* 'epic hero', Khotanese Saka *naḍaun-* 'man, hero' (from **nṛtāvan-*: Bailey 1976a:37; but see Abaev's objections, 1973:II.159-60); OGmc. *Nerthus* 'name of goddess', Oícel. *Njǫrðr* 'name of god', cf. Lith. *nértėti*, *nirtinti* 'make angry', *į-niřtęs* 'having become gloomy', *nařtsas* 'anger', OPruss. *nertien* 'anger', *er-nertimai* 'we become angry'.³³

The rise of long vowels and consequently of the zero ablaut grade can be given a similar phonetic explanation for Indo-European verbs as well. This pertains primarily to the verb with long vowels in the aorist. The aorist ending, when adjacent to a preceding stop, triggered lengthening of a preceding vowel; eventually this lengthening became a morphophonemic property of Indo-European aorist forms. This explanation for length can be proposed for formations of roots like **wet-* 'convey' and **et-* 'eat':³⁴

OCS *věsŭ* 'I conveyed', aorist of *vesti*; Lat. *uēxī* 'I conveyed', Skt. *á-vākṣ-am* 'I rode' (Watkins 1962a:29ff.).

OCS *jasŭ* 'he ate' (Watkins 1962a:43).

Latin and Slavic have a number of sigmatic formations whose length has the same source: the aorists Lat. *uēx-ī*, OCS *rěxŭ* < **rēks-* (from *rekq* '(I) speak'), *těxŭ* < **tēks-* (from *tekq* '(I) run'), etc. Sanskrit shows generalization of this principle to all stems, including those with ancient sonants, which regularly have the active sigmatic aorist in *vṛddhi* grade (see Kurylowicz 1956). The *vṛddhi* of perfects like *āsa* (perfect of *as-* < **es-* 'be'), *āda* (perfect of *ad-* 'eat'), *āja* (from *aj-* 'convey') is a Sanskrit innovation.

Another source of long vowels may have been sequences of vowel plus *w*, *y*

33. For the semantics cf. Hitt. *kartimmiya-* 'get angry', Slav. **sřrdii* 'make angry'. It is tempting to compare the Proto-Indo-European neuter (old inactive) **k̑her-t-* 'heart, core' with the unmarked root **k̑her-* 'destruction, ruin': Gk. *kēr* (from **ker-s*) 'death, destruction', gen. *kērós*; OIr. *irchre* 'destruction': *arachrin* (Thurneysen 1946:449). The semantic connection may have been 'cut' > 'remove innards, heart' > 'kill'. The last step is reflected in Greek; Irish reflects 'cut open' > 'kill'; cf. Alb. *ther* '(I) kill, cut open'. A derived meaning 'heart, core' from original 'cut' is semantically not very distant from the original meaning of the root.

34. For the phonetic grounds for the long vowel in these forms with old ejectives, see I.1.5.8 above.

in preconsonantal position. This can be phonetically characterized as fusion of the vowel and the sonant. A good example is the Indo-European word for 'bull, cow', **k'ou-*: Gk. *boûs* 'bull', Skt. *gáuḥ* 'bull', OHG *chuo*, Arm. *kov*, Latv. *gūovs* 'bull'. Preconsonantly, *-ou-* yields *ō*: nom. sg. **k'ou-s* > **k'ō-s* (Dor. Gk. *bōs*, Lat. *bōs*); acc. sg. **k'ou-m* > **k'ō-m* (Dor. Gk. acc. sg. *bōn*, Skt. *gām*). The sequence is preserved in prevocalic position: cf. Gk. gen. *bo(w)ós*, dat. *bo(w)í*, Lat. gen. *bouis*, Skt. dat. *gáve*, loc. *gávi*, gen. pl. *gávām* (see Thumb and Hauschild 1958:I:1.231-32; 1959:II.72-74).³⁵

3.1.10. The rise and development of the Indo-European ablaut alternations

Our analysis of the Indo-European ablaut alternations, and the internal reconstruction for early Indo-European ablaut patterns, make possible a dynamic conception of Indo-European ablaut and a reconstruction of its subsequent stages of development. The internally reconstructible original ablaut system must have involved two grades, conditioned by the previously phonemic dynamic (or stress) accent. The two grades can be described as strong grade (going back to an accented syllable) and weak grade (unaccented). Weak grade had two phonological variants, zero grade and reduced grade:

Strong grade: *V́*, where *V* → /e, a, o/

Weak grade → $\left\{ \begin{array}{l} \text{Zero grade} \\ \text{Reduced grade} \end{array} \right\}$

Zero grade → \emptyset

Reduced grade → ə

The next stage began when reduced **ə* became a full vowel, usually of *o* quality, in one root type and fused with an adjacent sonant or laryngeal in another. The resultant syllabic sonants, *i, u, r, l, m, n, H₁, H₂, H₃*, were in complementary distribution with nonsyllabic *y, w, r, l, m, n, H₁, H₂, H₃*, which brought about their merger into single sonant phonemes with syllabic and nonsyllabic allophones. Consequently, the original vowels **i, *u* became syllabic allophones of the sonants **y, *w*. The vowel allophones [e, a, o] thus became independent phonemes /e, a, o/; this entailed loss of phonemic distinctions among the laryngeals and their merger into a single laryngeal phoneme

35. The same process accounts for the development of a long vowel in IE **ous-* / **ois-* 'mouth': Skt. *ās-*, gen.-abl. Ved. *āsás*, instr. Ved. *āsā́*, Avest. *āh-*, Lat. *ōs*, gen. *ōris* 'mouth', OIr. *á* 'mouth', Olcel. *óss* 'mouth of river'. The reconstructed preconsonantal **-w-* / **-y-* is justified by Skt. *ósṭha-*, Avest. *aošta-* 'lip', OCS *usta* 'mouth', OPruss. *austo* 'mouth', beside Hitt. *aiš*, gen. *iššāš* 'mouth'.

which had syllabic and nonsyllabic allophones and in this respect belonged to the class of sonants.

The phonologization of the vowels gave independent phonemic status to the **o* that arose from the reduced vowel, and it changed **o* from a variant of weak grade into an independent ablaut grade. **o* grade was thus opposed to normal grade (the reflex of old strong grade) and zero grade (the reflex of the other variant of weak grade, in roots containing sonants or laryngeals). The new **o* grade began to penetrate a number of nominal and verbal form types, creating new paradigmatic oppositions between **o* grade and the normal and zero grades that for the most part reflected the old strong and weak grades. Thus the Indo-European ablaut mechanism took the form of alternation of the grades **e* (**a*), **o*, and Ø, with a new paradigmatic distribution of the accent in the various dialects.

The result of these changes was ablaut alternations of a binary type, opposing grades with vowels (*e* or *o*) to a grade without a vowel (zero). The grade with a vowel contains the morphophoneme *e/o*, and can be described as full vocalism in contrast to zero grade. Within the full grade there is a functional distinction between the normal, or basic, grade with **e* and the derived **o* grade. The derived nature of the **o* grade is preserved to the present day: the modern languages which retain **e/o* alternations have **o* in what are clearly derived morphological categories. The derived nature of **o* grade is also clear in Sanskrit, where after the merger of *e*, *o*, and *a* into *a* the old alternation of *e* and *o* was reanalyzed as an alternation of short *o* and long *ā* (cf. also the description of the vowel alternations in terms of three grades — zero, *a*, and *ā* — in the Sanskrit grammatical tradition).

At the same period, the originally allophonic long vowels *ā*, *ē*, *ō* acquired phonemic status when the combinatory factors that had originally conditioned their appearance were lost. The long vowels were opposed to their short counterparts in a phonemic contrast of length. Forms with long vowels thereby came to constitute a long, or tense, ablaut grade, morphophonemically opposed within paradigms to ablaut grades with short vowels.

Thus in addition to the original Indo-European ablaut rule:

$$\begin{bmatrix} e \\ (a) \\ o \end{bmatrix} \rightarrow \emptyset$$

there was the further:

$$\begin{bmatrix} \check{e} \\ \check{a} \\ \check{o} \end{bmatrix} \rightarrow \begin{bmatrix} \bar{e} \\ \bar{a} \\ \bar{o} \end{bmatrix}$$

The original relations among the vowels subsequently changed so that length oppositions arose among qualitatively different vowels: \check{e} could alternate not only with long \bar{e} but also with long \bar{o} , short \check{o} could alternate with both \bar{o} and \bar{e} . Thus the original one-to-one correlation between the short and long vowels was replaced by a one-to-many correlation as the result of analogical levelings and other changes:

$$\begin{bmatrix} \check{e} \\ \check{a} \\ \check{o} \end{bmatrix} \rightarrow \begin{bmatrix} \bar{e} \\ \bar{a} \\ \bar{o} \end{bmatrix} \Rightarrow \begin{bmatrix} \check{e} \\ \check{a} \\ \check{o} \end{bmatrix} \rightarrow \left\{ \begin{array}{c} \bar{e} \\ \bar{a} \\ \bar{o} \end{array} \right\}$$

Thus for late Indo-European the ablaut alternations were of two types: qualitative and quantitative. The qualitative alternations involved alternation of e and a with o ; the quantitative ones involved either reduction or lengthening (provided the normal grade is taken as the source, as is consistent with diachrony): \check{e} , \check{a} , and \check{o} were either reduced to zero or lengthened to \bar{e} , \bar{a} , \bar{o} :

$$\emptyset \leftarrow \begin{bmatrix} \check{e} \\ \check{a} \\ \check{o} \end{bmatrix} \rightarrow \begin{bmatrix} \bar{e} \\ \bar{a} \\ \bar{o} \end{bmatrix}$$

3.1.11. *The late Proto-Indo-European accent system*

The late Proto-Indo-European system of accentuation was closely bound up with the vowel ablaut system and functioned simultaneously with it. It was characterized by mobile accent which depended on the type of word and the paradigmatic form. This accent system is still well preserved in Sanskrit and Balto-Slavic paradigms (see Kurylowicz 1958, 1968, Illič-Svityč 1963:149, Kiparsky and Halle 1977, Garde 1976):

Skt.	nom. sg.	<i>duhitā́</i>	'daughter'
	voc. sg.	<i>dúhitar</i>	
	acc. sg.	<i>duhitáram</i>	
	dat. sg.	<i>duhitré</i>	
Lith.	nom. sg.	<i>duktė́</i>	'daughter'
	acc. sg.	<i>dùkterį</i>	
	loc. sg.	<i>dukteryjė</i>	
	voc. sg.	<i>duktė́</i>	
Russ. dial.	nom. sg.	<i>doč'í</i>	'daughter'
	dat. sg.	<i>dóčeri</i>	

The system is probably also preserved in Hittite (see Hart 1980).

The earlier Indo-European accent system, with dynamic mobile stress, caused the loss or reduction of unstressed vowels which led to the formation of the ablaut system (see 3.1 above). In contrast, the late Indo-European accent, mobile within paradigms, could not have been based on dynamic stress and did not produce loss or reduction of unstressed vowels. Thus we must assume a restructuring of the Indo-European accent system, from original dynamic stress to accent with a weak degree of stress which did not cause changes in the vocalic composition of wordforms. This is consistent with a system of tonal distinctions in which the accented syllables had only weak intensity.

The tonal interpretation of the late Proto-Indo-European accent system is supported by the historical reflexes in a number of daughter stocks: Sanskrit (see Burrow 1976:108-9, Thumb and Hauschild 1958:I.1.208-9), ancient Greek (Vendryes 1929), and Balto-Slavic (Garde 1976) are known to have had accent systems involving tonal distinctions. Indirect evidence is found in Germanic, in the voicing of fricatives in pretonic position as described by Verner's Law, a phenomenon typologically associated with tone (cf. Maddieson 1974).

In addition to mobile tone accent, the late Proto-Indo-European system also had paradigms exhibiting columnar accent, in which the accent always falls on the same syllable in the paradigm (see Kuryłowicz 1958, 1968, Illič-Svityč 1963):³⁶

Skt.	nom. sg.	<i>bhrátā</i>
	acc. sg.	<i>bhrātāram</i>
	dat. sg.	<i>bhrātre</i>
Serbo-Cr.	nom. sg.	<i>brāt</i>
	acc. sg.	<i>brāta</i>

3.2. The late Indo-European system of sonants and laryngeals

3.2.1. Positional determination of allophones of sonants. Three positional sonant allophones. Variation of nonsyllabic allophones

The fusion of a reduced vowel with a following sonorant to yield syllabic sonants facilitated the rise of a third sonant allophone, the combination of a

36. In addition to accented wordforms, we can distinguish a group of auxiliary words and particles which could attract the accent from an adjacent full lexeme, depending on position. As proclitics they attracted the accent from the following fully accented word: cf. Skt. *pāra dahī* 'gave away', Russ. *pró-dal* 'sold', the Old Irish stressable prefix *ro-*, etc.

syllabic element with a nonsyllabic one. This occurred in the positions defined by Sievers and Edgerton (Edgerton 1934, 1943; cf. Sihler 1969, 1971, Nagy 1970). In the positions CC__V, VHC__V, and #C__V (i.e. before a vowel) weak grade took the form of CCəRV, VHCəRV, and #CəRV respectively. These combinations then yielded CCRV, VHCŕV, and #CŕV, and then a syllable-dividing glide arose before the following vowel to produce sequences of the shape R̥R, i.e. syllabic plus nonsyllabic sonant.

This development was caused by the rules for syntagmatic combinability of syllabic elements, whereby two syllabic elements (syllabic sonant and vowel, or two syllabic sonants) could not be adjacent to each other. Any such sequences were broken up by a glide which was the nonsyllabic variant of the first element of the sequence. Thus the nonsyllabic R of the sequence type R̥R is the phonetic variant of syllabic R̥ that occurred before another syllabic element, either vowel or sonant.

This means that the sonant phonemes of Indo-European had three positional variants:

- | | |
|---------------------------|--------------------------|
| A. Nonsyllabic | [y, w, r, l, m, n] |
| B. Syllabic | [i, u, ɾ, ʎ, ɱ, ɳ] |
| C. Syllabic + nonsyllabic | [iy, uw, ɾr, ʎl, ɱm, ɳn] |

A. The nonsyllabic allophones appeared in the following positions:

V__V	Gk. <i>phér-ō</i>
VC__V	Skt. <i>mádhya-</i>
VC__R̥	Gk. <i>dóγμα</i> (-ma < *-mṇ)
V__RV	*t'érwo-s

Alternations involving the nonsyllabic allophones of different sonants can be found in Indo-European. In many cases they are purely phonetic in character; in others they are connected to morphological functions, which indicates subsequent morphologization of originally phonetic alternations (see Abaev 1973a, Swadesh 1970). In some Indo-European branches one alternant is preserved, while others show the other: e.g. [m] ~ [w] in Skt. *kṛ̥mi-*, Lith. *kirmis* 'worm' but OCS *črǫvŭ*; Lith. *pirmas* but OCS *prǫvŭ* 'first'; [r] ~ [n] in Gk. *dōron*, Arm. *tur*, OCS *darŭ* but Lat. *dōnum*, Skt. *dāna-*, OIr. *dán* 'gift'; [l] ~ [n] in Skt. *súvar-*, Avest. *hvar-* 'sun, light', Hom. Gk. *ēélios*, Lat. *sōl*, Goth. *sauil* 'sun' but Avest. gen. *xvāng* 'sun', Goth. *sunno*: PIE *sāwel- ~ *swen-; [r] ~ [l] in Skt. -ta(r), Gk. -tēr (*nomina agentis* suffix) but OCS -tel- (cf. *-ter in Slav. *větrŭ* 'wind'), Hitt. -talla- (but cf. also Hitt. -tara- in *weš-tara-* 'herder', *eku-tara-* 'one who drinks').

B. The syllabic allophones appeared in the following positions:

#_C	Skt. <i>úd-</i>
#_R	Skt. <i>ṛṇóti</i> , * <i>ṛ-n-</i> > Hitt. <i>arnu-</i>
C_C	Skt. <i>kr-tá-</i> , <i>prthú-</i>
R_C	Gk. <i>lip-</i>
R_#	Gk. <i>dóru</i> , <i>gónu</i>
C_#	*- <i>thṛ</i> , * <i>t'eḱh-m</i>

C. The syllabic + nonsyllabic allophones appeared in the following positions:³⁷

VCC_V	* <i>sphṛr-</i> > Skt. <i>sphuráti</i>
VCR_V	Skt. <i>ásviya-</i> (Gk. <i>híppios</i>)
VRC_V	
VHR_V	
VHC_V	
#C_V	Skt. <i>tuvám</i> , <i>siyám</i> , Lat. <i>diēs</i>
#R_V	

$$CC_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

$$CR_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

$$RC_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

$$HR_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

$$HC_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

$$\#C_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

$$\#R_{\text{R}} \left\{ \begin{array}{c} C \\ \# \end{array} \right\}$$

37. Some of the sonant combinations shown in the schemas were not actually realized because of restrictions on combinations of two or more sonants and certain obstruents with sonants. Even permitted Indo-European combinations of two or more sonants were changed in the daughter languages by addition of intrusive consonants or loss of one of the original consonants, e.g. *-nr-* > *-ndr-* in Gk. *andrós* < **anros*, cf. *anēr*; Skt. *strī* 'woman' < **srī* (Hitt. *-šar*).

From these formulas it can be seen that word boundary was functionally and distributionally equivalent to a consonant.

3.2.2. *The distributional features of the laryngeal*

A comparable system of syllabic and nonsyllabic allophones must be posited for the laryngeal as well. Nonsyllabic *H* and the syllabic *H̥* created by fusion with a preceding reduced vowel comprised a single laryngeal phoneme whose syllabicity was contextually determined. A glide marking syllable division arose between syllabic *H̥* and a following syllabic sound (vowel or sonant). This produced *H̥H* as a third allophone of the laryngeal. The allophonic distribution for laryngeals was identical to that of sonants. The *H̥H* allophone explains some idiosyncratic reflexes of the laryngeals in Hittite, as will be discussed below.

The laryngeal **H* functioned as a sonant in regard to syllabicity, but nonetheless differed from the sonants proper in a number of structural features, syntagmatic and paradigmatic. This is grounds for placing it in a separate class of phonemes in the Proto-Indo-European system. The Indo-European stem was structured according to a principle of rising sonority, with greatest sonority at the center; and the laryngeals, judging from their position in roots, had greater sonority than obstruents but less than sonants proper (cf. Gamkrelidze 1960:86ff.).

This is why the laryngeal behaves as a nonsyllabic element when adjacent to a sonant proper: in the position where syllabic allophones appeared, we find a syllabic sonant but not a syllabic laryngeal. Thus we have the following Indo-European bases, with a syllabic sonant but no syllabic laryngeal in their zero-grade forms:

<i>*k̑'enH-</i>	Skt. <i>jani-tā</i> 'parent', Gk. <i>genétōr</i>
<i>*k̑'ṇH-</i>	Skt. perf. pass. ppl. <i>jā-tá-</i> 'born'
<i>*senH-</i>	Skt. <i>sanō-ti</i> 'wins, obtains', Hitt. <i>šanḫ-</i> 'seek, strive'
<i>*sṇH-</i>	Skt. perf. pass. ppl. <i>sā-tá-</i> 'obtained'
<i>*bheuH-</i>	Skt. <i>bhāvitum</i> 'be'
<i>*bhuH-</i>	Skt. past ppl. <i>bhūtá-</i> 'having become'
<i>*phelH-</i>	Skt. <i>pārī-man-</i> 'fullness'
<i>*ph̥lH-</i>	Skt. <i>pūr-ṇá-</i> 'full, filled', Hitt. <i>palḫ-i-</i> 'wide'
<i>*therH-</i>	Gk. <i>térma</i> 'goal', <i>térmōn</i> 'boundary', cf. Hitt. <i>tarḫ-</i> 'defeat'
<i>*th̥rH-</i>	Skt. <i>tīrṇá-</i>

*t'emH-	Skt. <i>damitā</i> 'tamer'
*t'mH-	Skt. past ppl. <i>dāmtā-</i> 'tamed', Dor. Gk. <i>dmātós</i>

The same is true of laryngeals in the position between two consonants. Thus the laryngeals, which were opposed to the sonants proper in showing lower sonority, are to be assigned to the category of obstruents in this respect.

3.2.3. Reflexes of sonant allophones in the daughter branches of Indo-European

The system of syllabic and nonsyllabic allophones for sonants reconstructed for late Proto-Indo-European was destroyed in the daughter branches when syllabic sonants were vocalized and full vowels appeared. The vocalization can be regarded as phonologization of the reduced vowel that phonetically determined the sonority of a syllabic element. It led to elimination of the sonants proper as a class of sounds, and to the rise of the new subclass of sonorant phonemes.

The resultant full vowels caused major restructurings in the vocalic system: the sonants *i* and *u* split into two phonemes, vowels /i u/ and consonants /y w/, so that *i* and *u* joined the category of vowels.

The development of the syllabic sonants in the various daughter dialects is presented schematically in the following table:

PIE	Indo-Iranian	Ancient Greek	Latin	Celtic	Germanic	Baltic	Slavic
*r̥	-r̥-	-ra-, -ar-	-or-, -ur-	-ri-, -ar-	-ur-	-ir-, -ur-	-īr-, -ūr-
*l̥	-r̥-	-la-, -al-	-ol-, -ul-	-li-, -al-	-ul-	-il-, -ul-	-īl-, -ūl-

PIE ***k̑h̑rt̑-**: Gk. *kardíā*, *kradíē*, Lat. *cor*, gen. *cordis*, OIr. *críde*, Lith. *širdis*, OCS **śirdice* > *srūdice* 'heart'.

PIE ***t̑ȓk̑h̑-**: Skt. *dṛś-* 'view', Gk. *drakeîn* 'look, see', OIr. *drech* 'face' (< **t̑ȓ-k̑h̑*), Welsh *drych* 'view, mirror'.

PIE ***w̑lk̑h̑o-**: Skt. *vṛka-h̑*, Goth. *wulfs*, Lith. *vilkas*, OCS *vlīkŭ* 'wolf'.

PIE ***ph̑l̑th̑Hu-**: Skt. *pȓthú-* 'wide', Gk. *platús*, OIr. *lethan* 'wide'.

PIE	Indo-Iranian	Ancient Greek	Latin	Celtic	Germanic	Baltic	Slavic
*m̑	<i>a</i>	<i>a</i>	<i>em</i>	<i>am, em</i>	<i>um</i>	<i>im</i>	-ę- < -im-
*n̑	<i>a</i>	<i>a</i>	<i>en</i>	<i>an, en</i>	<i>un</i>	<i>in</i>	-ę- < -in-

PIE ***t̑e^hk̑hm̑th̑-**: Skt. *daśát-* 'decade', Gk. *dekás*, OCS *desętŭ*, Goth. *taíhun*, Lith. *dėšimts* 'ten'.

PIE ***k̑'o^hm̑-th̑o-**: Skt. *gatá-*, Gk. *batós*, Lat. *uentus* '(having) come' (past ppl.).

PIE **sephthm̥*: Skt. *saptá*, Gk. *heptá*, Lat. *septem* 'seven'.

PIE **m̥ṇthis*: Skt. *matíḥ* 'contemplation, thought', Lat. *mēns*, gen. *mentis* 'thought, mind', Goth. *ga-munds* 'memory', Lith. *mintis* 'thought', OCS *pa-męti* 'memory'.

The syllabic+nonsyllabic sonant allophones often fall together with the reflexes of the syllabic allophones. They have their own special reflex in Latin and Greek *-am-*, *-an-*, *-ar-*, *-al-*, in Sanskrit *-am-*, *-an-*, *-ir-*, *-ur-* (usually after labiovelars), in Slavic *-im-*, *-in-*, *-ir-*, *-il-*, in Iranian *-am-*, *-an-*, *-ar-*, *-al-*:

PIE **th̥ṇnu-*: Skt. *tanú-* 'thin', Gk. *tanú-* 'long' (Lat. *tenuis* 'thin'), OIr. *tan(a)e*, OHG *dunni*, OCS *tĭnŭkŭ* 'thin'.

PIE **sm̥mo-*: Skt. *samá-* 'same, similar', OPers. *hama-*, Gk. *hamó-then*, oud-*amós* 'none', Goth. *sums* 'some'.

PIE **ph̥ros*: Skt. *puráh*, Avest. *parō*, Gk. *páros* 'earlier'.

PIE **ph̥llu-*: Skt. *purú-* 'numerous', Avest. *pouru-*, OIr. *il*, Goth. *filu*, Lith. *pilus* 'many, numerous'.

PIE **k̥or̥u-*: Skt. *gurú-* 'heavy', Gk. *barús* 'heavy', Goth. *kaúrjōs* (nom. pl. fem.) < **kaúrus* 'heavy'.

The vocalic elements of these reflexes depended on the vowel and consonant systems in the early daughter dialects. *a* vocalism (Indo-Iranian, Greek) appears to be typical of the dialects in which *i*, *u* were not yet vowels but were still (syllabic) sonants at the time in question. After vocalization of syllabic **r̥*, **l̥*, **m̥*, **n̥*, there was a period when the category of sonants included only **y*, **w*/ with their syllabic allophones [i, u] and nonsyllabic [y, w]; cf. Greek alternations such as *leípō* : *élipōn*, *pheúgō* : *éphugōn*, etc.

In Celtic, Italic, Germanic, Baltic, and Slavic, where the vowel accompanying the old syllabic sonant is *i* or *u*, by the time in question the phonological connection between *y* and *i*, *w* and *u* had already been disrupted, and these sounds were independent consonants /y w/ and vowels /i u/. Compare, for example, the correlations in Latin, where at the time that syllabic sonants were vocalized a five-member vowel system /a, e, i, o, u/ had already formed; it coincides typologically with one of the ancient stages of Proto-Indo-European.

The Hittite reflexes of syllabic *r̥*, *l̥*, *m̥*, *n̥* are interesting in this regard. They are vocalized as *a* + sonorant, yielding the reflexes *ar*, *al*, *am*, *an*, which coincide in form with the reflexes of **or*, **ol*, **om*, **on*. The same is true of the sequence *enC*, which is reflected as *-ant-* in Hittite. Therefore, Hittite *aRC* can reflect either a syllabic sonant or **o* vocalism before a sonant. For example, Hitt. *arnu-* 'bring, lead off' can be interpreted as a reflex of either PIE **r̥neu-*, cf. Skt. *r̥ṇóti* 'moves', or **ornu-*, cf. Gk. *ór̥nūmi* '(I) move', Skt. *ár̥ṇa-* 'wave, stream'.

In Hittite, *w* and *y* were not phonemically distinct from *u* and *i*; together they formed single phonemes which can be described as sonants. Cf. Hitt. 3sg. pres. *kuenzi* 'kills', 3pl. *kunanzi*; *h̥uekzi* 'bewitches, curses', *h̥ukanzi*; *kuerzi* 'cuts',

kuranzi; *wešiya-* ‘buy’, *ušaniya-* ‘sell’; 3sg. pres. *autti* ‘you see’, 1sg. *uḫḫi*; *aiš* ‘mouth’, gen. *iššaš*; etc.

PIE **r̥*: Hitt. *parku-* ‘high’, Skt. *bṛhánt-* ‘high’, Avest. *bərəzant-*, Arm. *barjr* (PIE **bʰr̥ǵh-u*); Hitt. *parḫ-* ‘drive, drive off’, Skt. *pūrtá-*, *pūrtí-* ‘portion, part’ (PIE **pʰr̥H-*); Hitt. *tarḫ-* ‘conquer’, Skt. *tárati* ‘overcomes’, *-tūr*, *-tūr* in compounds (PIE **tʰr̥H-*).

PIE **l̥*: Hitt. *paltana-* ‘shoulder’, Gk. *plátanos* ‘sycamore’, *plátē* ‘shovel’, *ōmo-plátē* ‘shoulder blade’, Skt. *pr̥thú-* ‘wide’, OIr. *lethan* ‘wide’, OCS *plešte* ‘shoulder’ (PIE **pʰl̥-th-*); Hitt. *palḫ-i-* ‘flat, wide’, Lat. *plānus* (PIE **pʰl̥H-*).

PIE **ṇ*: Hitt. *dankui-* ‘dark’, OSax. *dunkar*, OHG *tunkal* (PIE **dʰṇ-k-*); Hitt. *pankuš* ‘all, whole’, Skt. *bahú-* ‘thick, dense, numerous’, Gk. *pakhús* ‘thick’ (PIE **bʰṇǵh-u-*).

Hittite reflects Indo-European syllabic **ṇ* as *a* before *s*, which must go back to an earlier sequence of *a* plus a nasal; the nasal was subsequently assimilated, yielding *-aš-*:

Hitt. *kuašk-*, iter. of *kuen-* ‘hit’: **kwṇsk-* > *kuask-*.

Hitt. *daššu-* ‘strong’ from **da(n)su-* < **dṇsu-*, Gk. *dasús* ‘dense’, Lat. *dēnsus* ‘dense, solid’ (PIE **tʰṇs-u-*).

Hitt. *a-šiwatt-* ‘poor, indigent’ (from ‘deprived, unfortunate’), Skt. *a-* < **ṇ-* ‘un-’ in compounds (e.g. *a-deva-*), Gk. *a-* < **ṇ-* ‘un-’: PIE **ṇ-tʰyu-* ‘non-god’ (for the semantics cf. Slav. *ne-bogŭ* [‘not’ + ‘god’], *u-bogŭ* ‘poor’).

We can also see Hitt. *ḫaš(š)-* ‘give birth’, *ḫaššant-* ‘son’, *ḫaššu-* ‘king’ as reflecting the same syllabic **ṇ* before *s*. This word can be compared to Skt. *ásuḥ* ‘breath of life; life’ (Schlerath 1968), *ásuraḥ* ‘leader, sorcerer’, Avest. *aṇhu-* ‘life’, OIcel. *áss* ‘ace’ to yield a protoform **Hṇs(-u)* with syllabic **ṇ* reflected in Hittite *-ašš-*. This interpretation establishes a clear connection to the compound *ḫašša ḫanzašša* ‘grandsons and great-grandsons’ (see Melchert 1973). The first element of the compound has the root in zero grade, **Hṇs-*, and the second element has *o* grade, **Hons-*.³⁸ The first element has the regular reflex *ḫašš-*, and the second has **Hans-* > Hitt. *ḫanz-*,³⁹ cf. Luw. *ḫamša-* ‘grandson’.

The treatment of Indo-European syllabic **m̥* departs in some respects from this picture of Hittite. Unlike the other sonants, syllabic **m̥* is reflected in Hittite with a vowel *u* followed by an **m* which undergoes the usual developments (changing to *n* word-finally). The *u* quality may be due to the labiality of the sonant. A vocalized syllabic **m̥* accounts for the ending *-un* of the 1sg. preterite (PIE **-m̥*, cf. 1sg. pres. *-mi*, parallel to the opposition of 2sg. pret. *-š*, 2sg. pres. *-ši*); the accusative singular ending in pronominal forms such as *kun* (from *kaš* ‘this’), *apun* (from *apaš* ‘that’); and the accusative plural ending *-uš* from **-m̥-s*.

38. Cf. Skt. *pautra-* ‘grandson’, *vr̥ddhi* grade of *putrá-* ‘son’ (Thumb and Hauschild 1958:I.1, §113, 173).

39. For the shift of *-ans-* to *-anz-* cf. *dagan-šepa-* > *daganzipa-* ‘Earth Spirit’, where original *s* changed to *z* after *n*; see also Oettinger 1980:44ff.

The syllabic+nonsyllabic allophones of the sonants are reflected more consistently and uniformly in Hittite. **rr*, **ll*, **nn*, **mm* regularly yield *arr*, *all*, *ann*, *amm*, with doubling of the sonant. Unexplained doublings of sonants in Hittite can be satisfactorily interpreted as instances of syllabic+nonsyllabic allophones. This is especially clear in the case of *-iy-* and *-uw-* sequences (see the distributional patterns above):

Hitt. *šuwai-* 'push, squeeze, force out': Skt. *śuvāti* 'brings into movement' (Couvreur 1937:221ff.).

Hitt. *tuwa* 'far', abl. *tuwaz* 'from afar', cf. Skt. *dū-ráh* 'distant', comp. *dāvīyas-*, superl. *daviṣṭha-* (Benveniste 1932c:142ff., Goetze and Pedersen 1934:71).

Hitt. *huwant-* 'wind': Lat. *uentus*, Goth. *winds*.

Hitt. *išhiya-* 'tie': Skt. *s(i)ya-* 'tie'.

Hitt. *ḫaštiyaš* (cf. nominative plurals in **-iy-es*, and Hitt. *ḫaštai* 'bone'): Skt. *āsthi*, Gk. *ostéon* 'bone'.

PIE **rr*: Hitt. *parranda* 'besides, moreover, above', cf. Skt. *puráh*, Avest. *parō*, Gk. *páros* beside Hitt. *para* < **pro*.

PIE **ll*: Hitt. *malla(i)-* 'grind', Arm. *malem* '(I) break', Welsh *malu* 'grind': PIE **mll̥-(o)*; Hitt. *kalleš-* 'call', Gk. *kaléō* '(I) call': PIE **khl̥-l̥-e(s)-*; Hitt. *nomen agentis* suffix *-tallaš*: *maniyahḫatalla-* 'ruler' (from **-thll̥-os*), cf. Slav. **-tel'* < **-thel-yo-*. The other agentive suffix in Hittite, *-tara-*, has a single *r*, which shows that it comes from a form with full vocalism, **-thor(-os)*, cf. Gk. *-tor*, *-tōr*.

PIE **mm*, **nn*: Hitt. *šanna-* 'single, one', *šannapi šannapi* 'separately, apart', Skt. *sama-*, OPers. *hama-*, Gk. *hamó-then*, Goth. *sums* 'someone': PIE **sm̥mo-*. Hitt. *innara-* 'courage', probably from **Hnaras*, cf. Skt. *nár-* 'man', Gk. *anér*, Skt. *sūnára-* 'full of life force'. The initial laryngeal is evident in the length of *ū* in Skt. *sūnára-* and possibly also in the prothetic vowel of the Greek form.

Such sequences of etymologically justified double sonants in intervocalic position triggered a Hittite distributional pattern whereby sonorants were geminate intervocalically. This was subsequently generalized to all intervocalic sonorants. This explains the doubling of sonorants in sequences of sentence-initial clitics: *nu* + *naš* > *nu-un-na-aš*. It also explains later compounds such as *u-nna-* 'drive home', *penna-* 'drive away', cf. Hitt. *nai-* 'lead', Skt. *nī-*, *nay-* 'lead'. Similar doublings occur in isolated instances in words with intervocalic sonorants: Hitt. *gi-im-ma-an-za* 'winter', cf. Skt. *hemantá-ḥ* 'winter'; also *wellu-* 'meadow', *šalli-* 'big', and others.

3.2.4. Allophones of the laryngeal phoneme and their reflexes in the historically attested Indo-European languages

The change in the sonant and vowel system of late Indo-European was intimately

bound up with changes undergone by the laryngeal phoneme in individual daughter dialects. Although the laryngeal formed a subclass of the sonants in showing both syllabic and nonsyllabic allophones, its subsequent development was different from that of the sonants *r*, *l*, *m*, *n*. In some dialects it tended to be lost postvocally, with compensatory lengthening of the preceding vowel:⁴⁰

PIE ***eH-**, ***aH-**, ***oH-** > dial. ***ē**, ***ā**, ***ō** (Hitt. *eḫ*, *aḫ*):

***dheH-** > ***dhē-**: Gk. *títhēmi* '(I) put', Skt. *dádāhāmi*, OCS *dějǫ*, Latv. *dēju*.

***t'oH-** > ***t'ō-**: Gk. *dídōmi* '(I) give', Skt. *dádāmi*, Lat. *dō*, OLith. *dúomi*.

***sthaH-** > ***sthā-**: Dor. Gk. *hístāmi*, Skt. *tíṣṭhāmi* '(I) stand'.

***phaH-** > ***phā-**: Skt. *pāti* 'guards', Lat. *pāscō*, *pāui* 'herd, pasture cattle', *pāstor* 'herdsman', Toch. B *pāsk-* 'guard'.

That the loss of the laryngeal and compensatory lengthening of the vowel were dialectal is shown by the fact that the laryngeal and a preceding short vowel are preserved in the Anatolian group: Hitt. *teḫḫi* '(I) put, place' (***dheH-**), *daḫḫi* '(I) take' (***t'oH-**), *paḫṣ-* 'guard' (***phaHs-**).

Initially before a vowel, the nonsyllabic laryngeal is lost completely in the first dialect group but preserved as *h* in Anatolian:

PIE ***#He-**, ***#Ha-**, ***#Ho-** > dial. ***e-**, ***a-**, ***o-** (Hitt. *ḫe-*, *ḫa-*): ***Hek'or-** > ***ek'or-**: Skt. *ágram* 'point, top', Hitt. *ḫekur* 'cliff, peak, high place'; ***Han-** > ***an-**: Lat. *anus* 'old woman', Gk. *annís* · *mētròs è patròs mētēr* (Hesychius) (Hitt. *ḫannaš* 'grandmother', Lyc. *ḫřna* 'mother', cf. Arm. *han* 'grandmother'); ***Hanth-** > ***anth-**: Lat. *ante* 'before', Gk. *ánti*, Skt. *ánti* (Hitt. *ḫant-* 'front side; forehead'); ***Has-** > ***as-**: Lat. *āra* 'altar', Osc. *aasaí* (Hitt. *ḫašša-* 'hearth'); ***His-** > ***is-**: Skt. *īṣā* 'pole, beam', Gk. *oíēks* 'ring on yoke', Slav. **oje*; ***Hos-th-** > ***osth-**: Goth. *asts*, OHG *ast*, Gk. *ózos* 'branch' (cf. Hitt. *ḫašduir* 'dry branches, brushwood').

Rather than compensatory lengthening, the dialectal lengthening of the vowel could just as well be viewed as fusion with a following pharyngeal continuant.⁴¹ The result was long vowels of various qualities, which merged with the long vowels that had arisen in tense (lengthened) grade. The dialects where laryngeals gave rise to vowel length preserved and even (as in Sanskrit) expanded the role of vocalic length as a phonologically significant feature.

The increased functional load of vowel length would also have been enhanced by the rise of long vowels from vocalization of long syllabic sonants. In some

40. In this respect, the laryngeals display some affinity with *y* and *w*, which fuse with a preceding vowel in certain positions to yield a long vowel; cf. Skt. *gā́m*, etc. 'bull' (3.1.9). Another affinity is the fact that many Indo-European roots with laryngeals have additional *y* or *w* in their reflexes; these apparently go back to features of the laryngeals (see 3.1.6 above). There is an intriguing typological parallel with Kabardian, where (according to Kuipers 1960) *h* is analogous to *y* and *w* in its syntagmatic behavior.

41. Marr (1922:328) perceptively suggested that Indo-European long vowels arose through replacement of "one of the lost spirants -h/' > ʏ/ʏ(ʔ)"; he based this on the development of ***maʔ** to *māl-* (*mēl-*) to Dor. *mālon*, Lat. *mālum* 'apple', a form often compared in the subsequent literature to Hitt. *maḫlaš* 'grapevine'.

dialects, long syllabic sonants arose from short ones when a following nonsyllabic laryngeal was lost (see Lindeman 1970, 1979, Beekes 1969). In -CRH-sequences, the sonant appears as its syllabic allophone and the laryngeal is nonsyllabic: -CR̥H- (this shows that sonants have a higher degree of sonority than the laryngeal).

Loss of a nonsyllabic laryngeal caused compensatory lengthening of a preceding syllabic sonant in the same way as it lengthened a preceding vowel. In Hittite, where a sequence of short vowel plus laryngeal yields vowel plus *h*, a sequence of short syllabic sonant plus laryngeal likewise yields a sequence consisting of the regular reflex of that sonant plus *h*.

The rise of long syllabic sonants, like the rise of long vowels before laryngeals, must be dated to a relatively late stage in the development of the individual Indo-European dialects. This is shown by the lack of homogeneity in the reflexes of vocalized long syllabic sonants in the various dialect groups. Even dialects as closely related as Indic and Iranian exhibit differences in their reflexes:

PIE	Sanskrit	Old Iranian	Greek	Latin	Celtic	Hittite
*-r̥H- > -r̥-	-īr-, -ūr- ⁴²	-ar-	-rā- (-ara-)	-ra- (-ar[a]-)	-rā-	-arh-
*-l̥H- > -l̥-	-īr-, -ūr-	-ar-	-lā- (-ala-)	-la- (-al[a]-)	-lā-	-alh-
*-m̥H- > -m̥-	-ā-	-ā-	-mā- (-ama-)	-ma- (-am[a]-)	-mā-	—
*-n̥H- > -n̥-	-ā-	-ā-	-nā- (-ana-)	-na- (-an[a]-)	-nā-	-anh-
*-iH- > -ī-	-ī-	-ī-	-ī-	-ī-	-ī-	
*-uH- > -ū-	-ū-	-ū-	-ū-	-ū-	-ū-	-uh- ⁴³

PIE **therH-* / **th̥rH-* > **th̥r̥-*: Skt. *tīrṇá-*, past ppl. of *táratī* 'crosses, defeats', Gk. *trētós* 'drilled through', cf. Hitt. *tarh-* 'conquer'.

PIE **kherH-* / **kh̥rH-* > **kh̥r̥-*: Skt. *kīrtī-* 'thought, recollection, fame'

42. -ū- occurs when a long syllabic sonant is vocalized adjacent to a labiovelar. This shows that Sanskrit had labiovelars at least until the time when the long syllabic sonants were vocalized. Cf. the vocalization of **ṛr* in *gurū-*, with initial **k̥*°o (cited in I.2.2.3 above).

43. Since short *i* and *u* had formerly been syllabic allophones of sonants, the rise of long *ī* and *ū* from sequences of short *i* and *u* after laryngeals were lost in the Indo-European dialects may have contributed to the subsequent split of the sonants *i/y* and *u/w* into phonemically distinct vowels *i*, *u* and consonants *y*, *w*. At first, long *ī*, *ū* were long syllabic allophones of the sonants *y* and *w* (which also had short syllabic allophones): cf. phonologically conditioned paradigmatic alternations like Skt. nom. *devī* 'goddess', gen. *devyāḥ*, *vadhū-* 'woman', gen. *vadhvāḥ*. Subsequently, long *ī* and *ū* began to contrast with their short counterparts in an opposition based on length. Thus the sonants *i/y*, *u/w* split into vowels proper *i*, *u* and consonants (semivowels) *y* and *w*. This triggered the complete elimination of the class of sonants, and the formation of phonemic systems with two sound classes, vowels proper (including *i*, *u*) and consonants proper (including the sonorants *r*, *l*, *m*, *n*, *y*, *w*).

Long syllabic sonants are reflected in Balto-Slavic as *i*, *u* plus sonorant with acute intonation; the corresponding short syllabic sonants do not have acute intonation.

from Skt. *carkarti* 'proclaim glory', *kārú-* 'singer', Gk. *kéruks* 'herald, crier, messenger', Goth. *hrōþeigs* 'glorious', OIcel. *hróðr* 'fame', OPruss. *kirdūt* 'listen'.

PIE ***k'oerH-** / ***k'oṛH-** > ***k'oṛ-**: Skt. *gūrtá-h* 'welcome', Lat. *grātus* 'pleasant, acceptable', Lith. *girti* 'glorify'.

PIE ***k̑herH-** / ***k̑ṛH-** > ***k̑ṛ-**: Skt. *śīrṣāṇ-* 'head', Gk. *kārā*.

PIE ***k̑'erH-** / ***k̑'ṛH-** > ***k̑'ṛ-**: Skt. *jūrṇá-* 'old' beside Gk. *gērōn* 'old man'.

PIE ***spherHk'-** / ***sphṛHk'-** > ***sphṛk'-**: Skt. *sphúrjati* 'becomes apparent', Avest. *fra-sparəya-* 'offspring, branch', Gk. *spharagéomai* '(I) swell up, burst', Lat. *spargō* '(I) scatter, strew'.

PIE ***t'elHgh-** / ***t'ḷHgh-** > ***t'ḷgh-**: Skt. *dīrghá-*, Avest. *darəga-* 'long', OCS *dlŭgŭ*, Serbo-Cr. *dŭg*, Russ. *dolgiy* 'long', cf. Hitt. *daluga-* 'long'.

PIE ***p̑elH-** / ***p̑ḷH-** > ***p̑ḷ-**: Skt. *pūrṇá-* 'full', Lith. *pilnas* 'full', Lat. *plānus* 'flat', cf. Hitt. *palḫ-i-* 'wide'.

PIE ***k̑'enH-** / ***k̑'ṇH-** > ***k̑'ṇ-**: Skt. *jā-tá-*, past ppl. of *jan(i)-* (Skt. *jani-tár-* 'parent', Gk. *genétōr*).

PIE ***t'emH-** / ***t'm̑H-** > ***t'm̑-**: Skt. *dāmtá-*, past ppl. of Skt. *damáyati* 'tames', Dor. Gk. *dmātós* 'tamed'.

PIE ***bheuH-** / ***bhuH-** > ***bhū-**: Skt. *bhū-tá-*, past ppl. of *bhavi-tum* 'be'.

PIE ***dheuH-** / ***dhuH-** > ***dhū-**: Skt. *dhūmáh* 'smoke' (cf. *dhaviṣyati*, fut. of *dhūnóti* 'shake, fan'), Lat. *fūmus* 'smoke', Lith. *dūmai*, OPruss. *dumis* 'smoke', OCS *dymŭ* 'smoke', cf. Hitt. *tuhḫ-ima-* 'asphyxia, shortness of breath', *tuhḫiya-*, *tuhḫai-*, *tuhḫa-a-it* (KUB XXXII 33, 18, 12) 'breathe heavily, pant'.

Initially before *w*, the laryngeal evidently appeared in its nonsyllabic form. In this position it is reflected in Hittite as *ḫ*, but lost elsewhere:

Hitt. *ḫuwant-* 'wind', gen. *ḫuwandaš*, nom. pl. *ḫu-wa-an-te-eš*, Lat. *uentus* 'wind', Goth. *winds*, Skt. *vāti* 'blows', Arm. *hovem* '(I) blow': PIE ***Hwe/onth-**. The prothetic vowel of the related Gk. *áwēsi* 'blows', *áella* 'wind, storm' shows that there may have been a syllabic **ḫ* in this form.

Hitt. *ḫueš-* 'live, exist', 3sg. *ḫu-e-eš-zi* 'lives, exists', caus. *ḫuešnu-* 'bring to life, leave' shows a nonsyllabic laryngeal in the same position: PIE ***Hwes-**, cf. Skt. *vásati*, Goth. *wisan* 'be, exist', Gk. pres. *iaúō*, aor. *á(w)esa* 'spend the night, sleep'.

Hitt. *ḫulana-* 'wool' (cf. *ḫu-la-a-li* 'spindle'), Lat. *lāna* < **wlāna*, Goth. *wulla*, Lith. *vilna*, Skt. *úrṇā* 'wool': PIE ***Hwḷn-**. In Hittite the nonsyllabic **H* is reflected as initial *ḫ*, and syllabic **ḷ* after *w* appears as *ul*. In the other Indo-European branches, the same syllabic **ḷ* undergoes lengthening adjacent to a laryngeal in a sequence of several sonants.

The nonsyllabic laryngeal is also reflected as Hittite *ḫ* in the position between a nonsyllabic sonant or *s* and a vowel. Elsewhere in Indo-European, the laryngeal is lost in this position: Hitt. *ešḫa-* 'host', OHitt. *ešḫe* 'lord (dat.)', Lat. *erus*

'lord, master, host': PIE ***esHo-s**.

Hitt. *ešhar* 'blood', gen. *ešhanaš*, Luw. *ašhar*, Skt. *ásṛk*, gen. *asnáh*, Gk. *éar* 'blood', Lat. dial. *asser*, Latv. *asins*, Toch. A *ysār*.

Hitt. *išhiya-* 'tie', Luw. *hišhiya-* 'tie', Skt. *syāti* 'ties'.

Hitt. *erḫa-* 'boundary, limit, region', *arḫa* (***o** or zero grade); Lat. *ōra* 'boundary, limit', Lith. *óras* 'air', *iš óro* 'outside': PIE ***erH-os**. The long *ō* of the Latin and Baltic forms may have been caused by the following laryngeal.

The sequence of vowel plus sonant plus laryngeal was equivalent to a single syllable consisting of a vowel plus a laryngeal. The combination constituted a phonemically long component (in contrast to a sequence of vowel plus obstruent plus laryngeal, in which the vowel was not lengthened), which functioned as an unbroken sequence within the syllable. Cf. the sequence of ***Hwln-** 'wool' above, which shows this distant influence of the laryngeal on the sonant.⁴⁴

In these positions the laryngeal is nonsyllabic and yields the Hittite reflex *h* (evidently a voiceless velar spirant [x]). The Indo-European voiceless postvelar (uvular) phoneme discussed in I.2.4.6 yields the same reflex. The laryngeal phoneme merges with the postvelar in certain positions, which indicates that the nonsyllabic laryngeal and the voiceless uvular were phonetically similar.

After a noninitial consonant and before a vowel, the nonsyllabic laryngeal is not reflected as a segmental phoneme in any Indo-European dialect, Hittite included.⁴⁵ Examples showing that the laryngeal was lost in this position in Hittite include the second-person singular ending *-tti* of the *-hi* conjugation: Gk. *-tha*, Skt. *-tha*, PIE ***-thHa**. Evidence for the laryngeal phoneme (in its nonsyllabic allophone) is the preservation of the aspirated voiceless stop (see Chapter 1 above, especially 1.4, for the distribution of aspirated allophones of the Indo-European voiceless stops).

The nonsyllabic laryngeal evidently develops in the same way in the position after velar ejectives. For Skt. *máhi* (neut.) 'big' (Gk. *méga*, *mégas* 'big', Lat. *magnus*, Arm. *mec*, Goth. *mikils*), *ahám* 'I' (Gk. *egṓ*, Lat. *egō*, Goth. *ik*), and *duhitā* 'daughter' (Avest. *duḡadar-*, Gk. *thugátēr*, Lith. *duktė*) we can recon-

44. At some time, evidently before the time when the laryngeals were lost, sequences of vowel plus sonant in position before a laryngeal acquired the status of phonemically long components, i.e. phonologically unitary elements. This shows that they can be regarded as distinct phonemic units, opposed to both vowels and sonants. They can be characterized as diphthongs consisting of vowel + (nonsyllabic) sonant or (nonsyllabic) sonant + vowel. This situation arose in late, dialectal Indo-European at the time when the laryngeals were being lost; it can be seen in some daughter languages (in particular, Baltic and Slavic) and takes the form of intonational and accentual oppositions of entire diphthongs.

45. Note the lack of Hittite words with stop-plus-*h* or *h*-plus-stop sequences. The few words with such sequences found in Hittite — *tetha-* 'thunder' (verb), *Gišnathita-* 'type of dish', *Duthaliya-* (name of king) — are of foreign origin and belong to the peripheral lexicon; therefore they do not reflect phonetic regularities of Hittite. Even in morphophonemics we find a tendency to eliminate such combinations, e.g. 2sg. *idalawaḫti* (*i-da-la-wa-aḫ-ti*) from *idalawaḫh-* 'do evil' shifts to *idalawatti* in order to remove the unnatural cluster *ḫt*; for a typological parallel cf. the development of 't to tt in Akkadian.

struct a laryngeal, since either the correspondence of Skt. *i* to Gk. *a*, or vowel length (Gk. *egō*), is the reflex of its syllabic allophone *Ḫ. It must be assumed that in certain paradigmatic forms of the first two words, vowel alternations produced structures in which the laryngeal was preceded by a consonant and followed by a vowel and therefore appeared in its nonsyllabic allophone. The laryngeal transferred its aspiration to the preceding consonant (which was already voiced by that time) and merged with it to yield a voiced aspirate. Hitt. *mekki* (neut. nom.-acc. *me-ik-ki*; *me-ik-ka-e-eš* 'numerous', cf. Toch. A *māk* 'many') is cognate to Skt. *māhi*, Gk. *méga*; it is regularly written with double *kk*. Here also the nonsyllabic laryngeal in the position C__V must have caused aspiration of the preceding consonant, which fell in with the reflexes of Series III (Gamkrelidze 1960:60ff.).

We see a special reflex of a laryngeal, one involving aspiration and eventual appearance in syllabic form, in Skt. *duhitā*, Gk. *thugátēr* 'daughter'.

The dialects which preserve the laryngeal (or, more precisely, its nonsyllabic allophone) as a separate segmental phoneme after vowels — that is, the dialects like Hittite, where combinations of short vowel plus laryngeal do not produce long vowels — tend to eliminate length as a phonological feature of vowels. The development of vowel length in the various Indo-European dialects is a typologically interesting example of two phenomena: first, the secondary, combinatory appearance of a feature in a system strengthens and extends the functional load of the phonemes carrying that feature; and second, a feature gradually dies out in a system when there is no secondary source of new phonemes carrying the feature.

In forms with zero grade, the laryngeal appears in the form of its syllabic allophone when positioned between two consonants, or between consonant and word boundary or word boundary and consonant (for the functional and distributional equivalence of consonant and word boundary see 3.2.1):

PIE *Ḫ > Skt. *i*, Lat. *a*, Gk. *α*:⁴⁶

*dheH- / *dhḪ-tho-: Gk. *thetós*, Skt. *hitá-h* 'taken'.

*t'oH- / *t'Ḫ-tho-: Gk. *dotós*, Lat. *dātus* 'given'.

*sthah- / *sthḪ-tho-: Gk. *statós*, Lat. *stātus* 'set, placed'.

In Hittite, as in several other languages, the reflex of the syllabic allophone of the laryngeal is *a*:

Hitt. *ma-ak-la-an-te-eš* (nom. pl.) 'thin': Gk. *makrós* 'long', *mākos* 'length'. The Hittite form points to a stem **mak-la-*, alternating with **mak-ro-* (PIE **mḪkḥ-ro-*); the full grade is represented by Dor. *mākos*, from **maHkḥ-*.

Hitt. *tamaš-* 'squeeze, press; torment', *ta-ma-aš-zi*, *ta-ma-aš-šir*, cf. Dor. Gk.

46. *Ḫ is normally reflected in Greek as *a*, cf. *rhēgnumi* : *errágēn*, *khrema* : *khraōmai*, *trēma* : *tráōmai* (Schwyzer 1939:1.340-41). The reflexes *e* and *o* of Ḫ seen in the zero-grade forms of *tithēmi* and *hístēmi* are due to the influence of the long vowel (Brugmann 1904:174, Kuryłowicz 1956:201).

dámnāmi, aor. *e-dāma(s)sa*, Dor. *dmātós* ‘tamed’, Lat. *domāre* ‘bridle, restrain; subjugate’, Skt. *damáyati* ‘tames’, *damitā* ‘tamer’. The Hittite form goes back to a protoform with a syllabic laryngeal between two nonsyllabic segments: ***t’om-H-s-**.

Hitt. *daš̥k-*, 1sg. *da-aš̥-ki-mi*, iterative-durative of *daḫḫi* ‘(I) take’: PIE ***t’oH-**. The iterative goes back to a form with zero grade for verbs in *-šk-* (Bechtel 1936:10): ***t’H-š̥k’h-**. Zero grade may also be represented by the plural forms of the same verb: 1pl. *daweni*, 2pl. *datteni* (*da-at-te-ni*), 3pl. *danzi* (*da-a-an-zi*).

If Hitt. *paš-* ‘swallow’ (3sg. *pa-aš̥-zi*, *pāši*, 3sg. imper. *paš̥du*) is cognate to Skt. *pānti* ‘they drink’, Gk. *pōihi* ‘drink’ (imper.), *pōma* ‘beverage’ (Sturtevant 1942:53; cf. Hitt. 3sg. *pa-aš̥-ta*, KUB XXIX 7 II 55 beside Ved. med. aor. *pāsta* ‘he drank’), then the protoform must be ***phoH-s-** > ***phH-s-**. Hittite *paš-* then goes back to the zero grade, with ***-H-** reflected as *-a-* between consonants.

In addition to *a*, the syllabic laryngeal is also reflected in Hittite as *u*: *daluga-* ‘long’ (cf. *da-lu-ga-aš̥-ti* ‘length’, Pol. *długość*), nom. pl. *da-lu-ga-e-eš̥* ‘long’. Hitt. *daluga-* evidently goes back to PIE ***t’lHgh-**, cf. Skt. *dirghá-*, Avest. *darəya-*, *darəga-*, OCS *dlŭgŭ*, Serbo-Cr. *dŭg*, Russ. *dolgij* ‘long’. Vocalization of syllabic ***l** created the form ***talHk-** in Hittite, with *H* reflected in late Hittite as *u*. The vocalization of sonants must have preceded the replacement of nonsyllabic laryngeal allophones by *h* and the vocalization of *H* in Hittite. Note that the Slavic cognate exhibits analogous treatment of the sequence of syllabic sonant plus laryngeal: OCS *dlŭgŭ*. The frequently noted similarities between the Hittite and Slavic forms need not point to a Hittite-Slavic isogloss, but can be interpreted as independent parallel development of the original elements in the two separate dialects.

H is also reflected as *u* in 1sg. *tuweni*, *tummeni* (*du-um-me-e-ni*), cf. *u-tum-me-ni* ‘we bring’, *pí-e-tum-me-ni* ‘we take’ (with prefixes *u-*, *pe-*), from PIE ***t’H-**. In contrast to these, the plural forms of *dai-* ‘put’, 1pl. *ti-(ya-)u-e-ni*, 3pl. *ti-(ya-)an-zi* (PIE ***dheH-**), which surely continue zero grade, have a palatal vowel as their reflex of IE *H*, consistent with the quality of the vowel in the full grade (see above for *y* and *w* with reflexes of the palatalized and labialized laryngeals). Note also that Greek reflects *H* as *e*, *a*, or *o* depending on the quality of the vowel in full-grade forms.

In the positions defined by the Sievers-Edgerton rule as showing the syllabic+nonsyllabic allophones of sonants (see 3.2.1 above), the laryngeal had a special syllabic+nonsyllabic allophone (similar to that of sonants) that can be rendered as *HH*. This allophone must be posited to account for a number of facts about Hittite, where in the position following an initial consonant and before a vowel the laryngeal is generally represented by *-ahh-*, with the velar spirant *h* written double (cf. the analogous treatment *arr*, *all*, etc. of syllabic+nonsyllabic allophones of sonants in Hittite):

Hitt. *paḥḫur* (*pa-aḫ-ḫur*, *pa-aḫ-ḫu-wa-ar*), gen. *pa-aḫ-ḫu-u-e-na-aš* 'fire', Gk. *pûr*, gen. *purós* 'fire', Oícel. *fýrr*, Goth. *fōn*, Arm. *hur* 'fire', *hn-oc* 'oven'. The long *û* of these forms is due to fusion of the *u* with the preceding *a* resulting from the syllabic laryngeal.⁴⁷ Based on the Hittite form, the syllabic variant of the laryngeal can be reconstructed in the protoform **pḥHHur*, reflected regularly in Hitt. *paḥḫur* with its double *ḫḫ*.

Hitt. *naḥḫan* 'veneration, worship; fear' (cf. the spelling *na-aḫ-ḫa-a-an*, Hat. I 8), ppl. *naḥḫant-* 'worshipping, respectful' points to **nḥHH-om*, **nḥHH-onth-*, with zero grade in the root (as is obligatory in Hittite for *-ant-* participles),⁴⁸ beside the full grade in the verb base *naḫ-* 'fear, worship', 1sg. *na-aḫ-mi* 'I fear', *naḥṣariya-* 'fear' (inf.) (OIr. *nár* 'modest, shy' < **nāsros*, *náire* 'modesty' < **nāsriyā-*).

Hitt. *lah(ḫ)u-* 'pour', 3sg. *la-aḫ-ḫu-u-i* 'pours', *la-aḫ-ḫu-u-wa-i* (KUB IX 31 II 9), 3pl. *la-aḫ-ḫu-u-wa-an-zi* points to **lḥHH-u-*. The same form underlies other Indo-European words such as Lat. *lauō*, Gk. *lóō* < *lówō*, fut. *lóusomai* 'I wash'. The Latin perfect *lāuī* shows a long vowel under the influence of the laryngeal.

The protoform **lḥHu-* accounts for the attested Hittite *lahḫu-* with the sequence *-aḫḫ-*. In the reduplicated form *lelḫuwa-*, 3sg. pres. *li-il-ḫu-wa-i* (VBoT I 14), which goes back to **lelHu-*, the root morpheme again has zero grade, but here we have a nonsyllabic allophone of the laryngeal in the environment between a non-initial consonant and a vowel (see the distributional pattern of sonant allophones described above). The alternation of *lahḫ-* and *-lḫ-* shows different allophones of the laryngeal in the position between a nonsyllabic and a syllabic element, in full accord with the distribution of sonant phonemes in analogous positions. The same relations in the protoforms are analogously reflected in Hom. Gk. *lówō* (Hitt. *lahḫu-*) and the reduplicated Hom. Gk. *lelouménos* 'having bathed' (Hom. *lelouménos Ōkeanoío* 'having bathed in the ocean', of Sirius: Iliad 5.6), cf. Hitt. *lelḫuwa-*.

This development of the syllabic+nonsyllabic allophone created a Hittite distributional pattern whereby *ḫ* occurred doubled after *a* but single after *e*, where it reflects a nonsyllabic allophone. Subsequently, this pattern spread to all instances of *ḫ* after *a* and *e* in Hittite.

The reshaping of the syllabic sonants and the laryngeal produced significant changes in the inherited Proto-Indo-European vowel system, which had distin-

47. Cf. e.g. *û* in Skt. *sūrya-* 'sun', from the *-āw-* sequence of **sāwel-* (Lat. *sōl*) beside Lith. *saulė* 'sun', Latv. *saūle*, Goth. *sauil*.

48. The same formation may appear in Hitt. *ša-aḫ-ḫa-an*, a term for a type of obligation. If this word is cognate to Hitt. *išḫiya-* 'tie' (cf. *išḫiul* 'treaty' with derivatives; Skt. *syāti* 'ties, fastens': PIE **sH-yo-*), the word can be derived regularly from **sḥHH-óm*, with a syllabic + nonsyllabic allophone of the laryngeal in the position #C__V.

guished only the three vowel qualities **e*, **a*, **o* and their long counterparts **ē*, **ā*, **ō* until the time when the laryngeals were lost.

3.2.5. *The changes of laryngeals adjacent to vowels in typological perspective*

The patterns for the development of Indo-European vowels adjacent to laryngeals receive some typological support from the data of Caucasian and Semitic languages, where we find similarities both in the behavior of vowels adjacent to laryngeal consonants and in the development of the vowel-laryngeal combinations. In Kabardian (Northwest Caucasian), the combinations *-eh-*, *-he-* change to long *ā* (Jakovlev 1923, 1948, Kuipers 1960, 1968). According to Kuipers's description (1967:28-29, 31, 401), comparable behavior of laryngeals can be observed in Squamish (Salishan), which has synchronic alternations like /əh/ ~ /ā/, and in which the phoneme sequences /əy, əw, əh/ are functionally close to /i, u, a/ and alternate with them.

In one of the earliest attested Semitic languages, Akkadian, *c* and *ḥ* are lost word-initially, changing the quality of a following vowel: cf. Sem. **caprum* > Akkad. *'epru(m)* 'dust' (Sem. **capr-*), **carābum* > Akkad. *'erēbu(m)* 'enter' (Sem. **c-r-b*), **ḥamm-* > Akkad. *'emmu(m)* 'hot'. But the same consonants, when they follow a vowel, cause lengthening as well as quality changes in the vowel: cf. Sem. **bacl-* > Akkad. *bēlu(m)* 'master', Sem. **raḥm-* > Akkad. *rēmu(m)* 'love, compassion', etc. (Gamkrelidze 1960:88, Keiler 1970:54).

However, there is an essential difference between the Indo-European laryngeal system and the Proto-Semitic laryngeals: they are associated with different phoneme categories in the two languages. In Indo-European they belong to the class of sonants in showing both syllabic and nonsyllabic allophones, while in Semitic they are typical consonants, with only nonsyllabic allophones. Thus, despite their possible phonemic similarities in the two languages, these consonants are markedly different in their phonological functions. Indo-European was functionally most similar to Semitic at the earliest stage, when the laryngeals functioned as properly consonantal phonemes. At that stage of Proto-Indo-European, when the consonant system contained a subclass of sonorants as well as laryngeals and the vowel system was the triangle /V i u/, its typological similarity to Proto-Semitic is most clearly visible. The subsequent restructurings in the Proto-Indo-European system took it farther from the Semitic model.

The same can be said of the similarity between the Indo-European laryngeals and the laryngeal phonemes of the Northwest Caucasian languages (Kuipers 1960, Allen 1956). The Indo-European laryngeals are comparable to the

Northwest Caucasian ones in the consonantal function that can be assumed for early stages of Indo-European.

3.2.6. *The tripartite subsystem of Indo-European phonemes and its transformation*

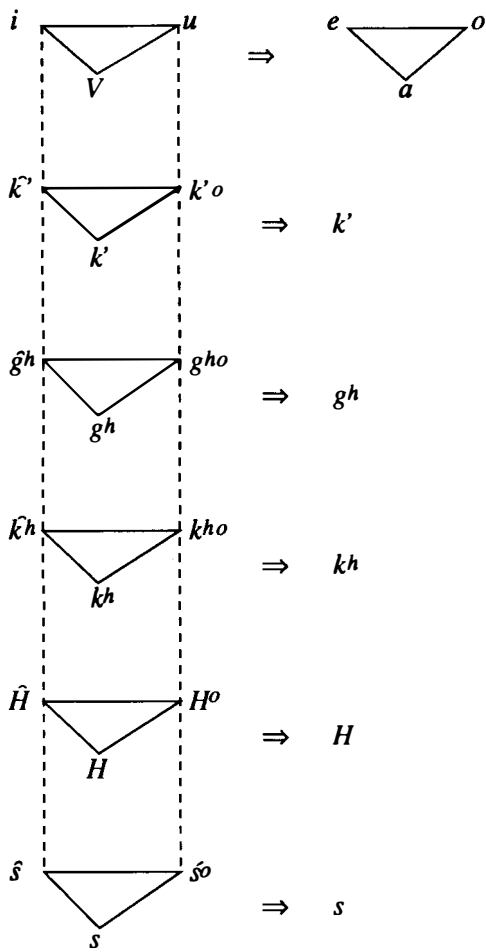
The reconstruction of the earliest Indo-European system of posterior consonants as having accessory features of palatalization and labialization, as well as neutral members, makes it possible to distinguish isomorphic tripartite phoneme correlations within the system. The triads contrast in the presence or absence of these features. There were three such triads among the stops: k' , $k'o$, and k ; $g'h$, $g'ho$, and gh ; and $k'h$, $k'ho$, and kh . This subsystem also included the three laryngeals \hat{H} , H^o , and H and the three sibilant spirants \hat{s} , s^o , and s . The accessory features defining these triads are a sort of reflection of the phonemic features of the original vowel system, i , u , and V . They create an interlinked subsystem of phonemes with identical three-way oppositions.⁴⁹

Also in agreement within this subsystem are the results of diachronic changes in each of the triads, all of which involved elimination of the accessory features of palatalization and labialization and the eventual reduction of the triads to one-member elements. Only the vowel system preserved its primary tripartite nature; its oppositions were transformed, but the number of opposed members stayed the same. The linked system of triadic oppositions is shown in Table 1.

49. The connection between the features of the vowel and consonant triangles is also justified by the fact that these phonetic features can be described in identical articulatory or acoustic terms for vowels and for consonants (Peterson and Shoup 1966, Ladefoged 1971:42). Kuipers 1960, 1968 comes to the similar conclusion that a three-way opposition of openness, palatalization, and labialization applies to consonants as well as to vowels.

Table 1

The Indo-European phonemes with tripartite oppositions,
and their transformations



Chapter Four

The structure of the Indo-European root

4.1. Canonical forms of root morphemes

4.1.1. The structural types of morphemes in Indo-European: root and suffix

The analysis of the Indo-European phonological system given above distinguishes the categories of consonant, vowel, laryngeal, and sonant, and describes the mechanism of vowel ablaut. With this system we can reconstruct the basic structural types, or canonical forms, for morphemes in late Proto-Indo-European and establish rules for their syntagmatic combination.

For late Proto-Indo-European of the period just before its breakup, several structural types of morphemes can be reconstructed. For a structural description it is useful to distinguish two classes of morphemes: roots and affixes. The root is that segment of a wordform that remains after the affixal elements have been removed from reconstructed protoforms. The affixal elements include not only productive morphological devices but also certain fossilized formatives which can be segmented off on the evidence of comparison to cognates in other languages, where the formative in question contrasts with others.

For instance, by comparing the cognates Lat. *hiems* 'winter', Skt. *héman* 'in winter', Gk. *kheimón* 'winter storm, winter', Hitt. *gimmant-* 'winter', and Avest. *zayan-* 'winter' we can reconstruct the Indo-European bases **ǵhei-* and **ǵheim-*. We can segment off an affixal element **-m-*, which contrasts with zero in **ǵhei-*. On these grounds, **ǵhei-* is the root, since it underlies all the derivatives of this form. Similarly, comparison of the cognates Skt. *náktam* 'at night', Lat. *nox*, gen. *noctis*, Gk. *núks*, gen. *nuktós* 'night', Hitt. *neku-* 'evening', *neku-zzi* 'it gets dark' yields the reconstructed protoforms **ne/okhoth-* and **nekho-*, where **-th-* can be segmented off as an affix and **nekho-*, which is found in all the formations of this group, can be taken as the root.

The following canonical forms can be distinguished as the basic structural types of root and base morphemes in late Proto-Indo-European:

I. $C^0_1VC^0_2-$

The symbol C^0 is generic for all classes of consonants: obstruents (C), sonants (R), and laryngeals (H). The possible combinations of phonemes in the root are the following (taking into account the constraints formulated as Rules

1-5 of Chapter 2):

- | | | |
|-----------------------|----------------|---|
| 1. CVC:- | *pheth- | Gk. <i>pétomai</i> , Skt. <i>pátati</i> 'fly' |
| | *sekho- | Gk. <i>hépomai</i> , Lat. <i>sequitur</i> 'follow' |
| | *khes- | Hitt. <i>kišai-</i> , OCS <i>česati</i> 'comb' |
| 2. CVR:- ¹ | *bher- | Gk. <i>phérō</i> , Skt. <i>bhárāmi</i> 'carry' |
| | *ghei- | Gk. <i>kheimōn</i> , Skt. <i>hemantāḥ</i> 'winter' |
| 3. RVC:- ² | *wekho- | Gk. <i>wépos</i> , Skt. <i>vāk</i> 'word, speech' |
| | *nekho- | Hitt. <i>neku-</i> , Lat. <i>nox</i> 'night' |
| | *yak'- | Skt. <i>yájati</i> 'makes sacrifice', Gk. <i>házomai</i> ,
<i>hágios</i> 'sacred' |
| | *wes- | Skt. <i>vásu-</i> 'good', Luw. <i>wašu-</i> 'good', Gk. <i>eús</i>
'good' |
| | *yekh- | Skt. <i>yácati</i> 'demands', Lat. <i>iocus</i> 'joke' |
| | *leggh- | Gk. <i>lékhetai</i> 'lies down', <i>léktron</i> 'couch',
<i>lókhos</i> 'couch', Lat. <i>lectus</i> 'bed' |
| | *reġ'- | Lat. <i>rēx</i> 'king', OIr. <i>rí</i> , Skt. <i>rāj-</i> , <i>rājan-</i>
'king' |
| | *reth- | Skt. <i>rátha-</i> 'chariot', OIr. <i>rethim</i> 'I roll',
Lith. <i>ritù</i> , <i>rìsti</i> 'roll', <i>rātai</i> 'chariot' |
| 4. RVR:- | *men- | Skt. <i>mānaḥ</i> , Gk. <i>ménos</i> 'spirit' |
| | *wer- | Lat. <i>uerbum</i> 'word', Gk. <i>weírō</i> '(I) talk' |
| 5. CVH:- | *dheH- | Gk. <i>títhēmi</i> , Skt. <i>dádhāmi</i> 'put' |
| 6. RVH:- | *loH- | Hitt. <i>laḥḥu-</i> 'pour', Gk. <i>lóō</i> , Lat. <i>lauō</i> 'wash' |
| 7. HVC:- | *Haph- | Hitt. <i>ḥap-</i> , Skt. <i>āp-</i> 'stream, water' |
| 8. HVR:- | *Hor- | Hitt. <i>ḥarana-</i> 'eagle', Gk. <i>órnīs</i> 'bird' |

II. C⁰₁VRC⁰₂-, with the following possible subtypes:

- | | | |
|-----------|-----------------|---|
| 1. CVRC:- | *bheudh- | Gk. <i>peúthomai</i> , Skt. <i>bódhate</i> 'awakes' |
| | *bhergh- | Hitt. <i>parku-</i> , Skt. <i>bṛhánt-</i> 'high' |
| | *t'erġh- | Gk. <i>dérkomai</i> , Skt. caus. <i>darśáyati</i> 'look' |
| | *thers- | Gk. <i>térsomai</i> 'dry out', Lat. <i>torreō</i> '(I) make
dry' |

1. Several suffixal morphemes have this same shape: ***-ther** (Skt. *jani-tár-*, Gk. *genétōr* 'sire, begetter'), ***-sor** (suffix in feminine numerals: Skt. *tisráḥ* 'three', Avest. *tišrō*, OIr. *téoir*, Welsh *tair*).

2. Roots with initial sonants are statistically restricted in Indo-European. In some ancient dialects (Hittite, Greek, Armenian), forms in initial *r-* are missing entirely; in these languages Indo-European roots with initial *r-* undergo phonetic reshaping, primarily by means of prothetic vowels: see Kuryłowicz 1927, Benveniste 1954:32-54, Lehmann 1951, Ondruš 1966:109 (with statistical data on roots with sonants, based on Pokorny's dictionary), but see Gercenberg 1972:160, Wyatt 1972 (an attempt to establish specifically Greek regularities for the prothetic vowels).

- | | | |
|----|------------------------|---|
| | *bhendh- | Goth. <i>bindan</i> , Skt. <i>badhnāti</i> 'tie', Gk. <i>pentherós</i> 'son-in-law, brother-in-law' |
| | *serph- | Skt. <i>sárpatai</i> 'crawl' |
| 2. | RVRC-: *leikh- | Gk. <i>leípō</i> , Skt. <i>riṇákti</i> 'leave' |
| 3. | HVRC-: *Hark̃- | Gk. <i>argós</i> , Skt. <i>árjuna-</i> , Hitt. <i>ḫarki-</i> 'white' |
| 4. | CVRR-: *t'or-u- | Gk. <i>dóru</i> , Skt. <i>dāru</i> , Hitt. <i>taru</i> 'tree' |
| 5. | CVRH-: *k'erH- | Skt. <i>jīrṇá-</i> , Gk. <i>gérōn</i> 'old' |

III. C⁰₁RVC⁰-, with the following possible subtypes:

- | | | |
|----|-----------------------|--|
| 1. | CRVC-: *sweph- | Skt. <i>svap-</i> 'sleep', Gk. <i>húpnos</i> 'sleep' |
| | *threph- | Skt. <i>trápate</i> , Gk. <i>trépō</i> 'turn over' |
| 2. | CRVR-: *threm- | Lat. <i>tremō</i> , Gk. <i>trémō</i> 'tremble' |
| | *dhwer- | Skt. <i>dvār-</i> , Lat. <i>forēs</i> 'doors' |
| | *threi- | Skt. <i>tráyah</i> , Gk. <i>treîs</i> , Lat. <i>trēs</i> 'three'; Lat. <i>trī-gintā</i> 'thirty' |

All of the above shapes have initial C-. Initial C- can also be represented by the cluster sC-, which was distributionally equivalent to C-:

- | | |
|--------|-------------------------------|
| sCVH- | Skt. <i>tíṣṭhati</i> 'stand' |
| sCVRC- | Hitt. <i>ištark-</i> 'be ill' |

IV. VC⁰-, with the following possible subtypes:

- | | | |
|----|-------------------------------|---|
| 1. | VC- *es- 'be' | Lat. <i>est</i> , Goth. <i>ist</i> , Skt. <i>ásti</i> , Hitt. <i>ešzi</i> |
| | *et'- 'eat' | Lat. <i>edō</i> , Gk. <i>edomai</i> , Skt. <i>áti</i> , Hitt. <i>etmi</i> , OCS <i>jamī</i> |
| | *eph- 'grasp' | Lat. <i>apīscor</i> , <i>coēpī</i> , Hitt. <i>epzi</i> , 2sg. <i>e-ip-ši</i> , Skt. <i>āpnóti</i> |
| | *ekho- 'drink (water)' | Hitt. <i>ekuzzi</i> , Toch. A <i>yoktsi</i> , cf. Lat. <i>aqua</i> 'water', Goth. <i>ahva</i> 'river', Olcel. <i>æger</i> 'sea god' |
| | *es- 'sit' | Hitt. <i>e-ša-ri</i> , Skt. <i>áste</i> , Gk. <i>hēsthai</i> |
| 2. | VR- *ei- 'go' | Skt. <i>émi</i> , Gk. <i>eîmi</i> , Hitt. <i>it</i> |
| | *er- 'move, attain' | Skt. <i>ṛnóti</i> , Gk. <i>órñūmi</i> , Hitt. <i>arnuzzi</i> |
| | *em- 'take' | Lat. <i>emō</i> , OIr. <i>em-</i> , Lith. <i>imù</i> , OCS <i>imati</i> |

The morpheme structure VC⁰- is especially typical of suffixal elements:

- *-eu-**, attributive suffix: Gk. *pakhéos*, gen. of *pakhús* 'thick'; Skt. *bahúh*, cf. Hitt. gen. *pangawaš* 'meeting'
- *-ei-**, nominal suffix: Skt. gen. *agnéḥ* from *agníh* 'fire'
- *-er-**, nominal suffix: ***phth-er-** (Gk. *pterón*, *ptéruks* 'wing')
- *-el-**, nominal suffix: ***Horel-** (Lith. *erėlis*, OCS *orlŭ* 'eagle')

***-aH-**, suffix on denominal verbs: Hitt. *newaḥḥ-*, Gk. *neáō*, Lat. *nouāre* ‘renew’

***-aH-**, suffix on collective nouns: ***ghoen-aH** ‘wife’ (OIr. *ben*, OCS *žen-a*)

***-es-**, in verb stems: ***lukh-es-** ‘shine, throw light’ (Hitt. *lukk-eš-*)

***-es-**, in noun stems: ***nebbes-** ‘sky, fog’ (Gk. *néphos*, Skt. *nábhas-*)

***-es**, nominative plural ending: Gk. *mētér-es*, Skt. *mātár-aḥ*

***-eth- / *-oth-**, nominal suffix: Hitt. *šiwatt-* ‘day’, Skt. *dyút-* ‘luster, light’

V. VRC⁰-

***eis-** Lat. *īra* ‘anger’, Skt. *éṣati* ‘slides’, *éṣa-* ‘haste’, Avest. *aēš-* ‘move quickly’, Gk. *oīma* ‘impact’

***eibh-** ‘copulate’ Gk. *oíphō*

VI. C⁰V-

Roots of this structure primarily include pronouns:

***me** ‘me’ Gk. *me*, Skt. *mā*, Avest. *mā*

***the** ‘you’ Lat. *tē*

***yo-** relative pronoun: Skt. *yáh*, OCS *i-že*, Phryg. *ios ni*

***so** demonstrative pronoun: Skt. *sá*, Gk. *ho*

***tho** demonstrative pronoun: Skt. *tád*, Gk. *tó*

***khoe** coordinating pronominal particle: Skt. *ca*, Gk. *te*

and also preposed particles:

***ne** negation: Lat. *ne-*, *neque*, OCS *ne-bogŭ*, Gk. *a-*

***phe-** preverb: Hitt. *pe-* in *pe ḫark-* ‘hold’, *peḫute-* ‘take away’

and verbal endings:

***-Ha** perfect ending: Gk. *-a*, Skt. *-a* in Gk. *oīd-a*, Skt. *véd-a*

VII. C⁰RV-

This structural type is found only in pronominal bases, including forms used in compounds. (See above for the possibility of interpreting the initial cluster in several examples as a unit phoneme.)

***swe-** reflexive, ‘one’s own’: ***swe-sor-** ‘sister’

***thwe-** ‘you (sg.)’, ‘your’: Skt. *t(u)vám*

***t’wō** ‘two’: Skt. *dvā́*, Lat. *duo*, Gk. *dō-* < **dwō-*

4.1.2. Roots with initial sibilant

The correspondence of Sanskrit initial Ø- to *s-* in the other languages (Skt. *páśyati* 'sees' : Lat. *speciō* 'I look', Gk. *sképtomai* 'I look', OHG *spehōn* 'regard', etc.) was interpreted above as reflecting an old sibilant *š-. This correspondence contrasts with one where Sanskrit initial *s-* corresponds to *s-* in the other languages (Skt. *sphāyate* 'gets fat, ripens' : Lat. *spatium* 'expanse, space', Lith. *spėti* 'have time, arrive in time', Hitt. *išpai-* 'get full, satiated'), reflecting PIE *s- (see I.2.4.1 above). We can therefore see the relevant Indo-European forms as roots with an initial sibilant, *š- or *s-, which does not fit into the canonical form C₁VC₂- and can therefore be regarded as prefixed (although the morphological function of the prefix is unclear): *š-C₁VC₂-, *s-C₁VC₂-.

Such forms, especially those with *š-, have been described as having *s*-mobile. They turn out to be prefixed with an *š- which was lost in Sanskrit as a purely phonetic process and shifted to *s-* in the other Indo-European dialects. Such forms should not be regarded as having a 'mobile' *s-*. Mobile *s-* can be posited only for individual forms which show both initial *s-* and lack of *s-* without any evident regularity: e.g. Gk. *tégos/stégos* 'roof', cf. Skt. *sthāgati* 'covers, conceals'; Lat. *corium* 'skin'/ *scortum* 'hide', OCS *kora* 'crust, bark'/ *skora* 'hide', Skt. *apa-skara-* 'defecation' (i.e. 'that which is eliminated, separated off', cf. *ara-s-kṛ-* 'secrete, exude': Mayrhofer 1956:I.38); and others (see I.2.4.2 above).

4.1.3. Structural types of root reduplication

The root structure C⁰₁VC⁰₂- (recall that C⁰ subsumes all non-vocalic phonemes, i.e. consonants proper and sonants) can also form reduplicated stems of several types: partial reduplication, where the initial consonant was reduplicated to yield C⁰₁V-C⁰₁VC⁰₂-; and full reduplication, where the entire root was repeated to yield C⁰₁VC⁰₂-C⁰₁VC⁰₂-.

I. Partial reduplication:

(a) Reduplication of the initial consonant plus *i: C⁰₁iC⁰₁VC⁰₂-:³

PIE *t⁺it⁺oH-: Gk. *dídōmi* 'I give', Osc. *didest* 'he gives', Skt. *dádāmi* (the change of the reduplicated vowel to *a* is a development that took place within Indic: cf. Pali *dinna*, Schwyzler 1939:I.686, note 8; Chantraine 1968-:280).

PIE *dhidhaH-: Gk. *títēmi* 'I put', Hitt. *títanu-* 'establish', Skt. *dádāmi* 'I put' (unlike *dádāmi* just above, *dádāmi* may reflect the parallel reduplication

3. This *i* may reflect the vowel phoneme *i of the archaic Indo-European three-vowel system /V i u/ (see I.3.1.2 above).

type with *e*, cf. Osc. *fefacit* ‘he would make’).

PIE **s/thistaH-*:⁴ Gk. *hístāmi* ‘I put’, Lat. *sistit* ‘he puts’, Skt. *tīṣṭhati* ‘he stands’.

PIE **phiphōH-* > **phibH-*: Skt. *píbati* ‘drinks’, OIr. *ibid*, Lat. *bibō* ‘I drink’.

PIE **phiph(o)IH-*: Skt. *píparmi*, Hom. Gk. *píplēmi* ‘I fill’.

PIE **k’ik’n-*: Gk. *gígnomai* ‘I am born’, Lat. *gignō* ‘I give birth’.

PIE **bhibher-*: Lat. *fiber* ‘beaver’, Gaul. *Bibracte* (personal name and river name), OBret. *Bibroci* (personal name), Mlr. *Bibraige*, OCS **bībrū*, OHG *bibar*. There was a parallel form with **e* in the reduplicated syllable, cf. Lat. *feber*, Skt. *babhrūḥ* ‘reddish-brown; ichneumon’, Lith. *bēbras* ‘beaver’; cf. the alternation of *i* and *e* among the forms of **dhaH-*, mentioned above.

(b) Reduplicated initial consonant plus *e/o* (normal reduplication): $C^0ieC^0_1VC^0_2-$

PIE **khoekhol-o-*: Skt. *cakrá-* ‘wheel’, Avest. *čaxra-*, OE *hwēol*, Gk. *kúklos*, Toch. A *kukāl*, B *kokale*, Phryg. *kíklēn. tēn árhton tò ástron. Phrúges* (Chantraine 1968:597); cf. PIE **kheel-* ‘rotate’, Gk. *pélomai*.

**meml-*: Hitt. *memal* ‘flour’ (< ‘ground’), cf. PIE **mel-* ‘grind’ (cf. Gk. *pai-pálē* ‘finely ground flour’ from *pálē* ‘flour’); cf. also Slav. **pe-pl-* in Russ. *pepel*, OCS *popelū* ‘ash’.

In addition to the parallel reduplicated forms in *i* and *e* above, compare Indo-European perfects like Hom. Gk. *gégone* ‘was born’ (cf. Skt. *jajāna* ‘gave birth’) (cf. zero grade in Hom. Gk. *ekgegátēn*, Skt. *jajñūr* ‘they gave birth’, PIE **k’ek’on-* : **k’ek’ṇ-*; for the reduplication **k’ik’n-* from the same root, see above); Skt. *cakāra* ‘did, made’, etc. The same structural type is reflected in Hitt. *wewak-* ‘demand’ (Avest. *vas-* ‘demand, wish’, Skt. *vaś-*), *lelḥuwa-* ‘pour’ (cf. Lat. *lauō* ‘(I) wash’, Hom. Gk. *lelouménos* ‘having bathed’), *mema-* ‘speak’, Luw. *mammanna-* ‘speak’ (cf. Gk. *mémona*, Lat. *meminī* ‘(I) remember’) (van Brock 1964).

Hittite (and other Indo-European dialects) have **o* vocalism (Hitt. *a*) in addition to *e* in reduplications: Hitt. *lalukkima-* ‘radiant; radiance, light’, *lalukki-* ‘light-colored’, cf. Hitt. *wawarkima-* ‘door hinges’ (cf. **werk-* ‘turn’: Pokorny 1959:1154).

Roots containing **u* show a special reduplication type, with *u* appearing in the reduplicated syllable: OIr. *-cúal(a)e* ‘he heard’, *-cúala* (< **kuklow*, Thurneysen 1946:425), MWelsh *cigleu*, Skt. *śu-srāv-a* ‘he heard’; *tu-tudé* ‘I shoved’, Lat. *tu-tudī* ‘I struck’. When there are parallel reduplicated forms in **e* such as

4. A special subgroup consists of forms showing reduplication of roots with initial *s-*. The patterns for reduplication in such roots are (Meillet 1937, 1938:199, Beekes 1969:123):

**si-sC⁰-*: Lat. *si-stō* ‘I put’, OIr. *-si-ssiur* ‘I hold on’, Avest. *hi-štaiti* ‘stands’, Doric Gk. *hístāmi* ‘I put’;

**C⁰i-sC⁰-*: Skt. *tī-ṣṭhati* ‘stands’, Luw. *ḫi-ṣḫiya-* ‘tie’.

Skt. *babhūva* beside Avest. *bubāva* 'he became', the *u* vocalism is considered the older one (Meillet 1938:198, 1937, Szemerényi 1970:271, Benveniste 1965, Watkins 1969:150; but see Strunk 1972). The *u* in the reduplicated syllable may reflect an ancient Indo-European vowel *u* (see Schmitt-Brandt 1967:26); cf. reduplication with *i*, discussed above.

II. Full reduplication (doubling): $C^0_1VC^0_2-C^0_1VC^0_2-5$

Full reduplication, also called intensive doubling, is found in what are called intensive verbs and in nouns of an expressive character (Meillet 1938:197, 223, 233, 287):

Skt. *vār-var(t)-ti* 'turns', 3pl. *vār-vṛt-ati*.

Skt. *jó-huv-ānaḥ* 'one who appeals', Avest. *zao-zao-mi* 'I call', Arm. *hot-ot-im* 'I sniff' (Meillet 1936:113).

Gk. *mormūrō* 'I flow rapidly', *gargairō* 'I boil'.

OHitt. *hulhuliya-* 'strike, kill' (van Brock 1964:134-35); Hitt. *pariparai-* 'play wind instrument', OCS *glagoljǫ*, Russ. *taratorit* 'chatter', Cz. *tratořiti*; OCS *klakolŭ* 'bell', Russ. *kolokol*, Lith. *kañ-kl-ės* 'stringed instrument', Skt. *kar-kar-ī-* 'musical instrument'.

Gk. *mármaros* 'stone, marble' (cf. Lat. *mar-mor*).

In expressive nouns with intensive doubling, variability of sonants is regular:

Gk. *paipálē* 'finely ground flour' (cf. *pálē* 'flour'), Hitt. *memal* 'flour' (see above).

Lat. *cancer* 'crayfish' < **car-cros*, Skt. *karkaṭa-* 'crayfish' (from Prakrit), Gk. *karkínos* 'crayfish'. The Greek form shows what is known as broken reduplication, with a full reduplicated syllable followed by a root reduced to its first consonant: $C^0_1VC^0_2-C^0_1-$; it may be that the accent originally fell on the first syllable of the reduplicated stem. Cf. also Lat. *for-m-(īdō)* 'fright', Gk. *mor-m-ō* 'bogeyman', *mór-mor-os* 'fear'.

The Indo-European word for 'ant', **mor-m(o)-*, obviously also represents broken reduplication: Lat. *formīca* (< **mormī-*, Ernout and Meillet 1967:247), Gk. *múrmēks*, *múrmos*; with variability of *m* and *w*: **mor-w-* in Avest. *maurvay-*, Sogd. *zm'wrc*, OCS *mravi*, Russ. *muravej*, but **wor-m-* in Skt. *valmīka-* 'anthill', *vamrá-* 'ant', Gk. *búrmāks*, *bórmāks* (Hesychius) (Pokorny 1959:749). The expressive value of broken reduplication in this word can be described as 'visual onomatopoeia' (cf. the reduplication of 'ant' in Kartvelian, 4.3.3 below); it is broadly comparable to the reduplication in the words for 'turn' (Skt. *var-vart-*) and 'wheel' (Gk. *kúklos*).⁶

5. When C^0_2 was RC, the root was reduplicated only up to and including the R. Thus the roots **ther-* and **therph-* reduplicate in the same way: **thor-thor-* and **thor-thorph-* (Meillet 1938:197).

6. Broken reduplication may also be involved in the Indo-European word for 'worm', **wor-m-* (possibly, via dissimilation of *w* to *m*, from **wor-w-*, ultimately from **wer-* 'bend, turn'): Lat. *uermis*, Goth. *waúrms* 'snake', OE *wyrm* 'worm', Lith. *vařmas* 'insect', OPruss.

4.2. Structural types of extended roots

4.2.1. The basic ablaut grades for root morphemes and their structural features

Each of the morpheme shapes listed above could occur in various ablaut grades in late Indo-European: in full grade (**e* or **o* vocalism) or in zero grade. Alternation of full and zero grade within the paradigm was the main type of ablaut alternation in Proto-Indo-European.

Zero grade arose in syntagmatic combinations of morphemes when a suffixal element with full grade was added to the root. When the suffixal elements were in zero grade, the root generally had full grade. Affixation of further morphemes in full grade regularly produces zero grade in all the preceding morphemes, root and affixal.

Cyclical rules for sequential combination of morphemes into a wordform were obviously in operation. The following ablaut rule can be set up for morpheme combinations in Indo-European:

In a morpheme sequence, only one of the morphemes can have normal grade (i.e. have **e* vocalism).

E.g. **t'er-* 'remove skin' (Russ. *deru* '(I) remove skin') : **t'er-w-*, **t'or-w-* 'tree' (Skt. *dāru*, Gk. *dóru*) : **t'r-eu-* 'tree' (Goth. *triu*, Lith. *drėvė*) : **t'r-u-* (Gk. *drūs* 'oak').

**khes-* (Hitt. *kišai-* 'comb') : **khs-en-* (Gk. *ksainō* 'comb' < **khsn-yō-*) : **khs-n-eu-* (Skt. *kṣṇāuti* 'whets, sharpens', *kṣṇótram* 'sharpening stone', ppl. *kṣṇutá-*, Avest. *huxšnuta-* 'well-sharpened').

**t'y-eu-* : **t'i-w-es* (Gk. *Zeús*, gen. *Diwós*, cf. Skt. *dyáuḥ* 'sky', gen. *diváh*).

An individual daughter language generally preserves only one of the possible vowel grades — normal or zero — since leveling in favor of one of the alternants has destroyed the original paradigmatic alternations. The levelings obscure the original intraparadigmatic ablaut relations of Indo-European, and create a new system of ablaut relations in which the earlier ones are generalized to the whole paradigm. The Proto-Indo-European ablaut system can be reconstructed by projecting the individual ablaut grades reflected in the various descendant forms back to the Proto-Indo-European stage and reducing them to a general Pre-Indo-European paradigm.

For example, the Greek verb *érgō* 'lock, contain' has stable **e* vocalism throughout the paradigm (Hom. *wérgō*, *eírgousi*, aor. *érksa*; *erkhthénta*, perf.

wormyan 'red' (< 'red worm'), ORuss. *vermie*, OFris. *worma* 'purple dye', OE *wurma*, Gk. *rhómos* 'tree worm' < **wrómos* < **wṛmos* (Pokorny 1959:1152). A typological parallel is the reduplication of Shuswap *pápíḣese* 'worm, caterpillar' (cf. *pápíḣe* 'snake'): Kuipers 1974:38.

érkhatai, pluperf. *érkhato*; *ewérgō*), while the Indo-Iranian cognate has zero grade of the root in all forms (Skt. *vrajá-* 'fenced-off place', OPers. *v(a)rdana-*, Avest. *varəzāna-* 'city', verb *varəz-* ~ *vəraz-*).

These forms can be projected to Proto-Indo-European to yield a paradigm with alternating full and zero grades: ***wer-*k̑*’-/*wr-(e)*k̑*’-**. There was subsequent generalization of one of the forms to the entire paradigm, independently in Greek and Indic.

We can be more confident in projecting a paradigm with two ablaut grades to Proto-Indo-European when at least one of the daughter languages preserves both grades while the others generalize one or the other of them. Examples are: Skt. *uṣāḥ* 'dawn' (zero grade), Hom. Gk. *ēōs* 'dawn', Lat. *aurōra*, Lith. *aušti* 'get light' (full grade), Hitt. *auš-*, *uš-* 'see': PIE ***aus-**, ***us-**.

Skt. *sárpatai* 'crawls', *sarpá-* 'snake', Gk. *hérpō* '(I) crawl, am prostrate', Alb. *gjárpër* 'snake', Lat. *serpō* '(I) crawl', *serpēns* 'snake' (normal *e* grade) beside Lesb. Gk. *órpeton* 'beast' (Pokorny 1959:912): PIE ***serph-** : ***sr̥ph-**.

The alternation of full and zero grade led to the alternation of syllabic and nonsyllabic allophones of sonants and the laryngeal, which were nonsyllabic in full-grade forms but appeared as syllabic or syllabic+nonsyllabic allophones (in the positions as defined in I.3.2.1) in zero-grade forms. Thus their syllabicity was determined by ablaut alternations within the (inflectional or derivational) paradigm.

The morpheme structure types for roots are listed above (4.1.1) in full grade, but each of them also occurred in zero grade when that was required by an affixed morpheme; at least one zero-grade form is attested for each:

- I.1 ***pheth-** / ***phth-** 'fly': Gk. *éptómēn*, *éptato*; *ptēsis* 'flight'
- I.2 ***bher-** / ***bhṛ-** / ***bhṛth-**: Lat. *fors* 'occurrence', *fortūna* 'fate', OIr. *brith*, *breth* 'portion; birth'
 ***ǵhei-** / ***ǵhi-** 'winter': Lat. *hiems*, Gk. *khión*
- I.3 ***wekho-** / ***ukho-** 'speak': Skt. *uk-tá-ḥ*
- I.4 ***men-** / ***mṇ-** 'think, idea': Skt. *matí-ḥ*, Lat. *mēns*, gen. *mentis*
- I.5 ***dheH-** / ***dh̥H-** 'put': Skt. *hitáḥ*, Gk. *thetós*
- I.6 ***loH-** / ***l̥H-** 'pour': Hitt. *lahḫuwai*
- I.7 ***Haph-** / ***Ḥph-**: Skt. *dvīpá-* 'island', *pratiṇpá-* 'upstream', *anūpá-* 'lying in the water'
- II.1 ***bheudh-** / ***bhudh-** 'wake, awaken': Skt. *buddhá-*, Gk. *á-pustos*, *pústis* 'remark, observation', Avest. *paiti-busti-* 'remark'
 ***bherǵh-** / ***bhṛǵh-**: Skt. *bṛh-ánt-*, Arm. *barjr* 'high'
 ***t'erkh-** / ***t'ṛkh-**: Skt. *dṛś-tá-* 'seen', Gk. aor. *édracon*
- II.2 ***leikho-** / ***likho-** 'leave': Gk. aor. *élipon*, Skt. past ppl. *riktá-* 'left'
- II.4 ***t'or-w-** / ***t'r-eu-** 'tree': Goth. *triu*

- II.5 ***k̑**'erH-/***k̑**'ȓH- 'old': Skt. *jīrṇá-*
- III.1 ***threph-**/***th̑rph-** 'turn': Gk. aor. *étrapon*, *eu-trápelos* 'mobile'
 sweph-**/suph-** 'sleep': Hitt. *šuppariya-* 'sleep', Gk. *húpar* 'in a waking state', *húpnos* 'sleep'
- III.2 ***dhwer-**/***dhur-** 'door': Gk. *thúra*, Lith. *duris*, OCS *dvīri*
 threi-**/thri-** 'three': Gk. *trípous* 'tripod', Lat. *tripēs*, Skt. *tripád-*, cf. Lith. *trikōjis* 'three-legged'
- IV.1 ***es-**/***s-** 'be': Lat. *sunt*, Goth. *sind*, Skt. *sánti*
 et'-**/t'-** 'eat': Lat. *dēns* 'tooth', gen. *dentis*, Skt. *dán*
- IV.2 ***ei-**/***i-** 'go': Skt. *i-máh*, Gk. *ímen*, Lat. *iter* 'path', Hitt. *itar* 'walking'
 er-**/r-** 'move': Skt. *ṛṇóti*, Hitt. *arnuzzi* 'brings'
 em-**/m̑-** 'have', 'hold': Lith. *imù*, OCS *imati*
- V ***eis-**/***is-**: Skt. *iṣṇáti* 'sends, chases'
- VI ***ne-**/***ṇ-** (negation): Skt. *a-*, Gk. *a-*, Lat. *in-* in privative compounds
- VII ***thwe-**/***thu:** Gk. *sú*, Lat. *tū*, Goth. *þu* 'you (sg.)'

Analogous alternations of full and zero grade must also be reconstructed for suffixal morphemes:

- IV.1 ***-es-**/***-s-**: verbs in *-s*: Toch. *luk-s-* 'throw light' beside Hitt. *lukk-eš-* 'becomes light'
- IV.2 ***-eu-**/***-u-**: Gk. nom. *pakhús*, Skt. *bahúḥ* 'dense, numerous', Hitt. nom. *pankuš*
 -ei-**/-i-**: Skt. *agníḥ*, Lat. *ignis* 'fire'
 -er-**/-r-**: Skt. *yákr-t* 'liver'

4.2.2. *The two ablaut states for stems and Benveniste's binomes*

When roots of the shape $C^0_1VC^0_2$ - took suffixes of the shape $-VC^0$, the result was a bimorphemic nominal or verbal stem which showed two basic ablaut states:

State I: root morpheme in full grade (originally, stressed); suffix in zero grade

State II: root morpheme in zero grade; suffix in full grade (originally, stressed).

These forms are known as 'Benveniste's binomes'. The two ablaut states can be generated with the following two rules:

- (1) A root in full grade requires a suffix in zero grade: $C^0VC^0-C^0$.
 (2) A suffix in full grade requires a root in zero grade: $C^0C^0-VC^0$.

Ablaut alternations in the stem must have distinguished grammatical or derivational categories, whose original meanings can only occasionally be reconstructed. In the verb stems of several late Indo-European dialects, the ablaut states were determined by tense (or, earlier, aspectual) oppositions: State I occurred in the present tense, State II in the aorist. Cf. Gk. pres. *pétomai* 'I fly', aor. *e-ptá-mēn* 'I flew off', Hom. *kata-ptē-tēn, éks-ptē* (Meillet 1938:216). Often only one of the ablaut states of the stem is reflected in a daughter language. In ancient Greek, a number of forms preserve only the second (aorist) state (Schwyzer 1939:I.742-43, Strunk 1967:48, Beekes 1969:226-27). We can bring such individual attested forms together under a single mechanism of ablaut alternations when we can put the various forms into a single derivational or inflectional paradigm:

State I	State II
*pheth-r-/-n-	*phth-er-/-n-
Hitt. <i>pattar</i> , gen. <i>pattanaš</i> 'wing', Lat. <i>penna</i> 'feather', OIr. <i>én</i> 'bird', OHG <i>fedara</i> , OE <i>feðer</i> 'feather'	Gk. <i>pterón, ptéruks</i> 'wing'

A nominal suffix **-er-/*-n-* can be segmented off on the evidence of the Hittite paradigm and the existence of a root **pheth-* 'fly, fall': Skt. *pátati*, Gk. *pétomai*, Lat. *petere*.

I	II
*ghei-m-	*ghi-em-
Gk. <i>kheimón</i> , Skt. <i>héman</i> 'in winter', <i>hemantá-</i> 'winter', cf. Hitt. <i>gimmant-</i> , OCS <i>zima</i> , Lith. <i>žiemà</i> 'winter'	Lat. <i>hiems</i> , Gk. <i>khiōn</i> , Avest. <i>zyā</i> 'winter', Arm. <i>jiwn</i> 'snow'

We can segment off a suffix **(e)m-* in this stem since there is a bare root **ghei-/*ghi-* with the same meaning: Avest. *zayana-* 'winter' (adj.), *zaēn-* (noun), Mod. Pers. *day*, Skt. *hāyana-* 'annual', *hāyaná-* 'year', OIcel. *gói* < **ghōyō(n)* 'February to March' (Szemerényi 1959, Anttila 1969:134). The State I stem **gheimo-*, **ghoimo-* is derived with a thematic suffix, which shows that

it is more recent than the State II stem (Szemerényi 1970:73, 188, Anttila 1969:164-65). However, the possibility that State I may be secondary compared to State II within Indo-European does not mean that both are not of Proto-Indo-European age; it only establishes the relative chronology for the evolution of the two states within Proto-Indo-European. The Sanskrit locative *hēman* reflects an old locative formation (Benveniste 1935) and may indicate great antiquity for State I stem forms.

I *t'ei-w-	II *t'y-eu-
Skt. <i>devāḥ</i> 'god', <i>devī</i> 'god- dess', Avest. <i>daēva-</i> 'demon', Lat. <i>deus</i> , Osc. <i>deívaí</i> , Umbr. <i>deueia</i> , OIr. <i>dia</i> , gen. <i>dé</i> 'god', Olcel. pl. <i>tívar</i> 'gods', OE <i>Tīg</i> 'Mars', Lith. <i>diēvas</i>	Skt. <i>dyáuḥ</i> 'sky, space, ether', Gk. <i>Zeús</i> , voc. <i>Zeû páter</i> , Skt. <i>Dyàus</i> <i>pitah</i> , Lat. voc. <i>Iuppiter</i> , Umbr. <i>Iupater</i> , OLat. <i>Diouis</i> , Osc. <i>Diúveí</i> , Lat. <i>diēs</i> 'day', Luw. <i>Tiwat-</i> 'Sun God', Hitt. <i>šiwatt-</i> 'day'.

A suffix **-w-/*-eu-* can be segmented off from this stem by comparison with the root **t'ei-* 'give off light': Skt. *dīdeti* 'throws light', Hom. Gk. *déato* 'it seemed', *dēlos* 'visible'. Further evidence for the segmentability is the fact that the same root occurs with suffixed **-n-*: Skt. *dína-m*, OCS *dīnŭ*, Lith. *dienà*, OPruss. acc. *deinan* 'day'; cf. the similar suffix of Hitt. *šiu-na-* 'god' (Laroche 1969). According to some scholars (Nehring 1940), the **-n-* suffix may indicate that this word had heteroclitic inflection. Judging from the semantics of its derivatives, the State I stem is derived and the State II stem basic. The State I stem appears in adjectival forms with the thematic suffix (Szemerényi 1970, Anttila 1969). However, the fact that the State I form is reflected in various Indo-European branches is firm grounds for positing its existence in Proto-Indo-European even though it is of later origin than the State II form.

I *ser-u-	II *sr-eu-
Lat. <i>serū</i> (see Anttila 1969:113)	Skt. <i>srávati</i> 'flows', Avest. <i>ravan-</i> 'stream', Gk. <i>rhéō</i> '(I) flow', OIr. <i>srúaim</i> 'river', Lith. <i>sraviù</i> 'flow', OCS <i>struja</i> 'stream', <i>ostrovŭ</i> 'island'

A suffix **-u-/*-eu-* can be segmented off in this stem since there is an Indo-European root with similar meaning, **ser-* 'move', Skt. *sáratī* 'flows, hurries', *sarít* 'creek', *sárma-* 'current', Hom. Gk. *hormḗ* 'pressure, urge, rush', Lat. *serum*, Gk. *orós* 'whey, sour milk'. State I is found only in the Latin form, attested in grammars (Benveniste 1935:151); it is likely to be secondary (Anttila 1969:113).

I
***phel-H-**
Gk. *pélas* 'skin, hide'

II
***phl-eH-**
Lith. *plėvė* 'membrane', OPruss.
pleynis, Slovene *plėva* 'eyelid', Russ.
pleva 'membrane'

In this root a suffix **-H-/*-eH-* can be segmented off since there is a root ***phel-** which has the same meaning and there are stems with suffixed **-n-* from the same root: Gk. *á-pelos* 'unhealed wound', *pélma* 'sole', OE *filmen* 'skin'; **-n-* derivatives are Gk. *péllās* 'skins', Lat. *pellis* 'hide', OHG *fel*, OE *fell*, OIcel. *fjall* 'skin, hide'. The State I form is poorly represented in Indo-European (Gk. *pélas*). The analysis of the final *-as* of the Greek form as an ending, by analogy to *déras* 'hide' (Anttila 1969:149, cf. Schwyzler 1939:I.514), is not supported.

I
***k̑heu-H-**
Skt. *śávīra-* 'strong'
(with long *ī* from *ĩ*),
Gaul. *kaúaros* (Pokorny
1959:592, but cf. Anttila
1969:142), OIr. *caur* 'hero'

II
***k̑hw-aH-**
Skt. *śvā-tr-á-* 'helper', *śvāntá-*
'useful', Dor. Gk. *pāma* 'property',
pāsasthai 'own, rule'

The stem is attested without the suffix **-H-/*-aH-* in such forms as Skt. *śávas* 'heroic strength' (beside *śávīra-* 'strong, powerful'), cf. Hitt. *šūwa-* 'fill up, swell up' (3sg. med. pres. *šuwattari*, 3sg. pres. *šuwattat*), Gk. *kuéō* 'fill up, be pregnant', aor. *ékusa*.

I
***phe/ol-th-**
Goth. *falþan* 'put together'

II
***phl-eķh-**
OHG *flehtan*, Lat. *plectō*, Gk. *plékō* 'I plait', Skt. *praśna-* 'plaiting, wicker-work', OCS *plesti* 'plait'

7. We assume that there existed stems ***phel-ķh-** and ***phl-eķh-**, although only one of them is attested. When these forms are juxtaposed there can be no doubt that there is a root ***phel-** with an alternation of zero and full grades.

I

***k'oer-H-**Skt. *garimā* 'weight'

II

***k'or-eH-**Skt. *grāvan-* 'stone for pressing out soma', OIr. *bráu* 'grinder, handmill'

An Indo-European suffix **-H-/*-eH-* can be identified in this stem since there is a bare root **k'oer-* with the related meaning 'heavy' (Skt. *gurú-*, Gk. *barús*, Lat. *grauis*). A word for 'grindstone' was evidently derived from this root with the suffix **-H-(n-)* (despite the doubts of Anttila 1969:139). Therefore we can assume that the **-H-* suffix is also present in the Germanic forms Goth. *-qairnus*, OIcel. *kvern*, OE *cweorn* 'grinder, handmill'.

I

***t'eġh-m-**Skt. *dāśa*, Lat. *decem*, Gk. *déka*, Goth. *taíhun*, OIr. *deich* 'ten'

II

***t'ġh-om-**Gk. (*triā-*)*konta*, Bret. (*tre-*)*gont* 'thirty' (*tre-* 'three') (Szemerényi 1960:IV)

A suffix **-m-/*-om-* can be identified since there is a suffixed form in **-u-* from the same root: **t'eġh-u-*, Lat. *decuria* 'group of ten', Gmc. **tigu-* 'decade' in Goth. *fidwōr-tigjus* 'forty', OIcel. *fjórer-tiger*, OE *fēower-tig*, OHG *fior-zug* 'forty'.

I

***Har-ġ'-**Skt. *árjuna-* 'light, white', Lat. *argentum* 'silver', Toch. A *ārki*, Hitt. *ḫarki-* 'white', Gk. *argós* 'white'

II

***Hr-eġ'-**Skt. *rajatá-* 'whitish, silvery'

Here the suffix **-ġ'-/*-eġ'-* can be posited since there are Indo-European forms with comparable meanings such as Gk. *ármē · leuké* 'whiteness' (Hesychius). The root is **Har-*, cf. Specht 1944:114.

I

***au-s-**Lat. *aurōra* 'dawn', Lith. *aušti* 'be light', *aušrà*, Hom. Gk. *ēōs* 'dawn'

II

***w-es-**Lat. *Vesta* 'goddess of hearth', *Vesu-vius* (Anttila 1969:119), Skt. *vāsará-* 'morning (adj.), day', Skt. aor. *avasran* 'they cast light', perf. *vavasra*

The suffix **-s-/*-es-* can be identified when this form is compared to Hitt. 1sg. pres. *uḫḫi* 'I see', 2sg. pres. *autti*, 1pl. pres. *aumeni*, 2pl. pres. *autteni*.⁸

I	II
*ḡher-s-	*ḡhr-es-
Gk. <i>kheirōn</i> 'worse', Mlr. <i>gerr</i> 'short'	Skt. <i>hrasvá-</i> 'less, small', <i>hrasati</i> 'decreases'

Here we can posit a suffix **-s-/*-es-* on the evidence of forms without the suffix like OIr *gair* 'short' (Anttila 1969:134).

4.2.3. Indo-European stems with a laryngeal suffix found in only one ablaut state

The preceding section surveyed Indo-European stems which occur in both of the two alternating ablaut states, Benveniste's State I and State II. In addition to these, there is a small set of forms where the root is paired with a suffixed stem which shows one of the two possible ablaut states. Among such pairs, State II predominates in the suffixed form; State I is extremely rare.

Root	State II
*t'el-	*t'!-H-gh-
OCS <i>-diliti</i> 'lengthen', Russ. <i>dlit'</i> id., OIcel. <i>talma</i> 'leave, detain'	Skt. <i>dīrghá-</i> 'long', Avest. <i>darəga-</i> , <i>darəṣa-</i> , Hitt. <i>dalugaeš</i> , <i>dalugašti-</i> 'length'
*Haḱh-	*Hḱh-eH-
Skt. <i>ásmā</i> 'stone', Avest. <i>asman-</i> 'sky', Gk. <i>ákmon</i> 'anvil'	OCS <i>kamy</i> 'stone', Skt. <i>śí-śā-ti</i> 'sharpen' (Anttila 1969:63)

8. The opposition of suffixes **-s-* and **-es-* (zero vs. full grade) may have indicated transitivity vs. intransitivity of the verbal stem: cf. **aus-* 'get light' (intransitive) and **wes-* 'cast light, burn' (cf. Skt. *avasran* 'they cast light', Lat. *Vesta*). This meaning, expressed by different suffixal vocalism, is very clearly preserved in some ancient Indo-European languages: cf. Hitt. *lukk-eš-* 'burn, shine' (intrans.) beside Toch. B *luk-s-* 'cast light' (trans.); Hitt. *paḫ-š-* 'guard, observe (rules); defend' (trans.) beside *pa-š-* 'swallow'. The productive Hittite suffix *-eš-* (full grade) forms intransitive denominal verbs, while zero-grade *-š-*, a relic preserved only in a few verbal derivatives, forms transitives.

***Hau-**

Skt. *ótu-* ‘woof’,
Lith. *áusti* ‘weave’, past
áudžiau ‘I wove’

***k̃hei-**

OCS *sěřũ* ‘gray’

***t’eu-**

Arm. *tevem* ‘I stay’,
Skt. *dāvīyas-* ‘further’
(comp. degree of *dūrā-*),
OIr. *doē* < **dōwyo-* ‘slow’,
OCS *davě*, *davīnũ* ‘ancient,
long-standing’, cf. zero grade
in Hitt. *tuwa* ‘from afar’

***wer-**

Hitt. *wer-iya* ‘call’, Gk.
eírō < **wer-yō* ‘I call’,
Lat. *uerbum*, Goth. *waúrd*
‘word’

***ther-**

Gk. *teírō* ‘I wipe’, Lat.
terō, Russ. *tru*, *teret’*
‘rub, wipe’

***mel-**

Lat. *molō* ‘I grind’, OIr.
melim id., Hitt. *malla-*
‘grind’, OCS *meljō* ‘I grind’

***Hw-aH-**

Skt. *vā-* ‘weave’, *váyati* ‘weaves’,
Oícel. *váð* ‘cloth’, Lith. *vóras* ‘spider’,
Gk. *átrion* ‘warp; cloth’

***k̃hy-eH-**

Skt. *śyāvā-* ‘dark’, Avest. *syāva-*, Mod.
Pers. *siyāh*, Lith. *šėmas* ‘dark blue’

***t’w-aH-**

Gk. *dén* < **dwān*, *dērón* < **dwāron*
‘for a long time’, Arm. *erkar* <
**dwāro-* ‘long’

***wr-eH-**

Gk. *rhēma* ‘word’, *rhētōr* ‘orator’

***thr-eH-**

Gk. *títrēmi* ‘I pierce’, OHG *drāen*,
OE *ðrāwan* ‘twist, spin; sharpen’

***ml-eH-**

Dor. Gk. *blāks* ‘soft’ (Anttila
1969:110)

***k'oer-**

Skt. *giráti* 'devours',
 Avest. *Jaraiti*, Gk. *borós*
 'voracious', *dēmo-bóros*,
 Lat. *carni-uorus*, Arn. *ker*
 'food'

***k'o_r-oH-**

Oícel. *krás* 'tidbit', Gk. *brómē* 'food'

***t'er-**

Lith. *diriù, derù, dìrti*
 'cut off', Latv. *nuōdara*
 'pole with branches cut off',
 Russ. dial. *dor* 'logs that
 split easily'

***t'r-oH-**

Oícel. *tróð(a)* 'pole', MHG *truoder*
 'pivot', Russ. *drat* 'strip, tear'

In these words the suffix in the State II stem generally consists of a vowel plus a laryngeal, so that the form of the stem is CR-VH-. In State I we would expect to find CVR-H-, where the *-H- would be visible only in the Indic forms and to some extent in the Greek ones (with Skt. *i* corresponding to Gk. *a*). Elsewhere in Indo-European (with the possible exception of Hittite) the *H* was lost without a trace. If Sanskrit and Greek (and Hittite) cognates are lacking, there is no possibility of reconstructing a State I form with any degree of reliability. This is why in these sets the stem suffixed in *-H- is paired only with the bare root.

In summary, the forms surveyed in these two sections allow us to reconstruct Proto-Indo-European roots with the morpheme structure C⁰VC⁰- which took -VC⁰- suffixes to form extended roots. These occurred in the two morphophonemic alternant forms identified by Benveniste:

State I
 C⁰VC⁰-C⁰-

State II
 C⁰C⁰-VC⁰-

4.2.4. Indo-European 'triconsonantal' roots with *Schwebeablaut*

In addition to the stems just surveyed, consisting of C⁰VC⁰- roots and -VC⁰ suffixes, we must also reconstruct for late Proto-Indo-European an unsegmentable stem type with three consonants, one vowel, and ablaut alternations:

C⁰₁VC⁰₂C⁰₃- ~ C⁰₁C⁰₂VC⁰₃- where C⁰₂ = R

In terms of the principle for classifying morphemes given above, these must be described as roots containing three consonantal (nonsyllabic) elements. Unlike the biconsonantal C^0VC^0 - root type, the triconsonantal one has two ablaut forms with full grade, differing in whether the vowel precedes or follows the second consonant (R):

Type A: Vowel before R	C^0VRC^0 -
Type B: Vowel after R	C^0RVC^0 -

This pattern of two full-grade forms can be described as involving movement of the vowel relative to the sonant within the root. This is called 'mobile ablaut' or *Schwebeablaut*.

In addition to the two full-grade forms, each such root also has the regular zero grade C^0RC^0 -, which then is a zero-grade correspondent to both full-grade types A and B.

The root type with Schwebeablaut descriptively subsumes the root types II.1 (C_1VRC_2 -) and III.1 (C_1RVC_2 -), both of which have vowels in a fixed position relative to the second root consonant. The Schwebeablaut roots differ from others of the same shape in the mobility of the vowel in the full grades.

Roots with Schwebeablaut can be reconstructed for the following Indo-European forms:

Type A	Type B
*t'e/oru-	*t'reu-
Skt. <i>dāru</i> , Gk. <i>dóru</i> , Hitt. <i>taru</i> 'tree', Welsh <i>derwen</i> 'oak'	Goth. <i>triu</i> 'tree', Lith. <i>drėvė</i> 'hollow in tree'

This base, meaning 'tree; oak' (P. Friedrich 1970:140ff., Benveniste 1954:257-59), can be semantically compared to ***t'er-** (Lith. *derù*, *dirti* 'cut off', Latv. *nuōdara* 'pole with branches cut off', Russ. dial. *dor* 'logs that split easily') and ***t'r-oH-** (Oícel. *tróð(a)* 'pole', Slav. *drati* 'remove skin or bark'; see 4.2.3). This may indicate (*contra* Anttila 1969:121) that the form is an extended root in Benveniste's sense with two ablaut states, ***t'or-u-** / ***t'r-eu-**.

*k'e/onu-	*k'neu-
Skt. <i>jānu</i> , Lat. <i>genū</i> , Hitt. <i>genu</i> , Gk. <i>gónu</i> 'knee'	Goth. <i>kniu</i> , OHG <i>knio</i> , Oícel. <i>kné</i> 'knee', Avest. <i>huxšnaoθra-</i> 'good knee' (Bartholomae 1904, Anttila 1969:133)

The presence of Type B for this root in Germanic and Avestan shows that both alternants can be reconstructed for Proto-Indo-European.

***k'oeru-**

Lat. *uerū* 'sharpened pivot', Umbr. *berva*; OIr. *biur* 'spear', Goth. *qairu* 'sharpened stick'

***k'oreu-**

Avest. *grava-* 'cane pole'

***se/onu-**

Skt. *sānu* 'back'

***sne/ou-**

Gk. *nōta* (pl.) 'back' < **hnowāta* (Szemerényi 1967:17-24, Anttila 1969:151)

***Hawi-**

Lat. *avis*, Arm. *haw* 'bird', Gk. *aietós* 'eagle', Bret. *houad* 'duck'

***Hwei-**

Skt. *véh*, pl. *váyah* 'bird', *vāyasá-* 'bird, crow'

***k'enH-**

Skt. *janitā*, Gk. *genétōr* 'parent'; cf. zero grade Skt. *jātá-*, Lat. *nātus*, Gaul. *gnātha* 'daughter', OIcel. *kundr* 'son', cf. Gk. (*kasí-*)*gnētos* 'son'

***k'neH-**

OIr. *gnú* 'I make' < **ġnēyō*, Skt. *jñātī-* 'relative', Gk. *gnōtós* 'relative, brother', Goth. *knōdai* 'clan', dat. of **knōps*, OHG *knōt* 'clan', Latv. *znuōts*, cf. Lith. *žėntas* 'daughter's or sister's husband'

Here the forms of Type B (**k'neH-*) are kin terms, and some investigators link them not with the Type A form (**k'enH-*) meaning 'give birth' but with the root meaning 'know', which usually appears in the form of Type B: **k'neH-*, Skt. *jñā-* 'know', OPers. *xšnā-*, Gk. *égnōn*, Lat. (*ig*)*nōscō*, OE *cnāwan*, OCS *znati* 'know', Toch. A *āknats* 'ignorant'. This etymology can provide justification for uniting the meanings 'give birth' and 'know, come to know'. Then the meanings of the two words are associated with the two ablaut types: Type A is primarily 'give birth' and Type B is 'know, come to know' (but see Anttila 1969:129-33).

***k'herH-**

Gk. *kerásō* 'I will mix', aor. *ekéras(s)a*

***k'hraH-**

Skt. *śrāyati* 'cooks', OE *hrēr* 'lightly cooked' (Pokorny 1959:582)

Here Type A is found only in Greek, where it can be interpreted as a secondary form (cf. Anttila 1969:67ff., 140). Then the reconstruction of Type A, and consequently of Schwebeablaut for the Proto-Indo-European root (rather than just for early Greek), becomes highly tentative; its plausibility depends on the historical interpretation of the Greek forms.

***phelH-**

Skt. *pārīṇas-ā* 'richly', Ved.
pārīman- 'wealth, fullness',
 Avest. *parənah-vant-* 'wealthy';
 Skt. *pārīmaṇ-i* 'fully', cf.
 zero grade in Skt. *pūrṇá-* 'full',
 Lith. *pilnas*, OCS *plünŭ* (Serbo-
 Cr. *pŭn*), Goth. *fulls*, OIr. *lán*
 'full'

***phleH-**

Skt. *prāyaḥ* 'for the most part',
 Avest. *frāyō*, Gk. *plē(i)ōn*, OLat.
pleores, OIr. *lía* 'plus'
 (Szemerényi 1964:256)

Type A is clearly reflected only in the Indo-Iranian words, which gives Anttila (1969:145-47) reason to doubt the Proto-Indo-European status of the form **phelH-*. However, since it is difficult to see these words as Indo-Iranian innovations, any doubts about their Proto-Indo-European age can be dismissed. Note that, judging from their meaning, the Proto-Indo-European zero-grade forms are probably derived from the Type A root rather than from Type B.

***HerH-**

Skt. *arítár-* 'rower', cf.
 Gk. *erētēs* 'rower' (from
**er-étēr*), Skt. *aritra-* 'oar',
 OPruss. *artwes* 'sea journey'

***HreH-**

Lat. *rēmus* 'oar', OE *rōðor* 'oar',
 OIcel. *róþr*, OHG *ruodar* 'oar'

The fact that Type A of this root occurs in Indic and Greek is sufficient to reconstruct it as Proto-Indo-European.

***k'oeiH-**

Skt. *gáya-* 'estate, property,
 household', Avest. *gayō* 'life',
 Hom. Gk. *béomai* 'I will live',
 Arm. *keam* 'I live', Lith. *gajùs*
 'easily cured'; cf. zero grade in
 Skt. *jīrá-*, *jīvá-* 'alive', Lat. *uīuus*,
 OCS *živŭ*, Lith. *gyvas* 'alive'

***k'oyeH-**

Avest. *Jyātum* 'life' (Gk. *zōō*; but
 cf. Anttila 1969:137), Toch. B *śaul*,
 A *śol* 'life' (Winter 1965:190)

For this root, unlike the others of this shape, Type B is less well represented; however, there is no doubt that it is Proto-Indo-European.⁹

***k_hoeiH-**

OCS *pokořǫ* 'peace, quiet';
cf. zero grade in OCS *počiti*
beside Lat. *tranquillus* 'calm',
Goth. *hveila* 'leisure, time'

***k_hoyeH-**

Avest. *šyāta-* 'gladdened', OPers.
šiyāti- 'prosperity', Lat. *quiēs*
'quiet', *quiēscō* 'I rest'

Here Type B is dominant, although Type A and not Type B is found in Slavic. Anttila's claim (1969:143) that OCS *pokořǫ* is an innovation within Slavic is not convincing, since there are no other examples of analogous innovations.

***Honr-**

Gk. *ónar* 'sleep', Alb. (Geg)
ândërr, (Tosk) *ëndërrë*
'sleep' (Hamp 1967:187)

***Hner-**

Arm. *anurj*, Gk. *óneiron* 'sleep'
(see Anttila 1969:90, 127, 160,
Hamp 1984a:130)

***werdh-**

Gk. *orthós* 'straight', Skt.
várdhati 'grows, multiplies',
vřddhá- 'grown, big',
vřddhi- 'strengthening'

***wredh-**

Gk. *rhéthos* 'member, body, face',
Alb. *rit* 'I grow, increase', OCS
rodŭ 'clan', *roditi* 'give birth'

***k_henth-**

Gk. *kentéō* 'jab', Hom. *kéntron*
'one who butts', *kéntōr* 'chaser
of horses', *kontós* 'pole', cf.
OHG *hantag* 'sharp', Latv. *sīts*
(zero grade) 'hunting spear'

***k_hneth-**

Ved. Skt. *śnath-* 'stab' (Grassmann
1873:1414-15), Avest. *snath-*

There is simply no justification for proposing that the Greek form is secondary (see Anttila 1969:140, 175, where no proof is offered for the claim that zero-grade forms — which are absent from Greek — influenced the attested ones). These forms provide a good example of the alternation of A and B types in the Indo-European root.

9. Hamp 1976 sees this form as a stem in two ablaut states of Benveniste's type:

I ***k_h'_{oi}-H-**: Skt. *gáya-*, Avest. *gayō* 'life'

II ***k_h'_{oy}-eH-**: Avest. *jyātum*, Gk. *béomai*, Arm. *keam* 'I live'.

***Heugho-**

Gk. *eûkhos* 'glory', *eûkhomai* 'I glorify, pray', Skt. *óhate* 'glorifies', Avest. *aoJaite* 'said', *aogadā* 'announced'

***Hwegho-**

Skt. *vāghát-* 'worshiper', Lat. *uoueō* 'I promise', *uōtum* 'vow', Umbr. *vufetes* 'vōiūs', Arm. *gog* 'tell!'

The Type A form can fairly confidently be reconstructed for Proto-Indo-European on the strength of the Greek data, despite some doubts as to whether the Iranian forms are original (see Anttila 1969:128-29).

***Hauk'-**

Lat. *augeō*, Gk. *aúksō*, Lith. *áugti*, Goth. *aukan* 'grow', Toch. A *oksiš* 'grows'

***Hwek'-**

Lat. *uegeō* 'I grow', Goth. *wahsjan* 'grow', OE *wōcor* 'future generations', Skt. *vakṣ-* 'grow', Gk. *aéksō* 'I multiply'

***werk'-**

Gk. *érgō* (from *wérgō*) 'I prop up, surround'

***wrek'-**

Skt. *vrajá-* 'fenced area, fence', Avest. *varəzāna-*, OPers. *v(a)rdana* 'village', OIr. *fraig* 'wall, wattle fence'

***pherk'h-**

Lith. *peršù* 'I seek in marriage', OHG *fergōn* 'ask', Umbr. *persnimu* (Szemerényi 1959:237), Arm. *p'ésay* 'suitor'

***phrek'h-**

Skt. *praśná-*, Avest. *frašna-* 'question', Lat. *precor* 'I ask', Goth. *fraihnan* 'ask', Lith. *prašau* 'I demand', OCS *prosiiti* 'ask', Toch. A *prakās*, B *preksa* 'ask' (pret. 3)

Both ablaut types of this root can be reconstructed with some certainty as parts of a single paradigm for Proto-Indo-European. The zero-grade forms of Skt. *pr̥cchāti* 'asks', Lat. *poscō* < **porscō*, OHG *forscōn*, Lith. *piřšti* could theoretically be derived from either Type A or Type B.

***dheus-**

Lith. *daūsos* 'paradise, tropical countries', OCS *duxŭ* 'breath, spirit', *duša* 'soul', Goth. *dīus* 'wild animal'

***dhwes-**

Gk. *theós* 'god', Lat. *bēstia* 'wild beast', Lith. *dvasas*, *dvasià* 'breath, spirit, soul', Latv. *dvēsele* 'spirit, soul, life'

Type A of this root is found only in Balto-Slavic and Germanic, which shows that it had some dialectal restriction in Indo-European.

***thers-**

Avest. *taršta-* 'terrible', Gk.
étersen 'trembled', Lat.
terreō 'I frighten'

***thres-**

Skt. *trásati* 'trembles', Avest.
θrāṅhayete 'frightens' (cf. OPers.
tarsatiy 'is afraid', Avest. *tārās-* 'be
 afraid'), Gk. *tréō* 'I tremble, fear'

The metathesis and secondary status of Type A in this root, proposed by Anttila 1969:114, are not fully justified. These forms are sufficient for reconstructing a Type A root for Proto-Indo-European.

4.2.5. *The triconsonantal roots with Schwebeablaut and their morphological segmentability*

When we compare the roots with Schwebeablaut and the stems showing States I and II in alternation as defined by Benveniste, it is obvious that the two patterns of ablaut alternation are identical. The basic difference between the two groups of roots lies in whether the portion showing the vowel alternation is morphologically segmentable or not. However, this distinction belongs entirely to morphology and has no impact on the mechanism of morphophonological alternations: from the viewpoint of morphophonological behavior, the analyzability or non-analyzability of the string into morphemes has no functional significance. The ablaut behavior is the same in both cases. Whether we regard the root plus suffixal morpheme of the first type as a unitary stem or regard the synchronically unanalyzable second type of root as a sequence of root plus suffix, either way we can reduce the two synchronically distinct structural types to one.

These two theoretically possible ways of reducing the two structural groups to one clearly reflect the way in which the alternating forms of the first group could have subsequently evolved, with the root and suffixal elements fusing into new unanalyzable units in the daughter dialects.¹⁰ They also show how the alternating structures of the second group probably arose within Proto-Indo-European: C⁰VC⁰- roots fused with suffixes to form a new structural type of

10. The development of root + suffix sequences into stems perceived as unsegmentable roots is illustrated by many of the examples listed above as showing States I and II. Synchronically unsegmentable forms include Lat. *penna* 'feather', Russ. *pero*, OHG *fedara* 'feather'; Lat. *hiems* 'winter', OCS *zima*, Lith. *žiemà* 'winter'; Gk. *pélas* 'hide, skin', Lith. *plėvė* 'membrane', Russ. *pleva* 'membrane'; Goth. *falþan* 'put together'; Skt. *dása* 'ten'; Lat. *argentum* 'silver'; Lat. *aurōra* 'dawn'. For examples showing the change of Indo-European morphologically complex words into unanalyzable roots in Germanic, see Makaev 1970.

root morpheme.¹¹ This second assumption amounts to an internal reconstruction within Proto-Indo-European, reconstructing the earlier type of root morpheme for a period antedating the late Proto-Indo-European stage.

And in fact the third consonants of roots with Schwebeablaut largely coincide with those found in the suffixal elements of stems alternating according to Benveniste's pattern. Both contain *-w-*, *-H-*, *-th-*, *-k̑h-*, *-r-*, *-s-*. The final consonants of Schwebeablaut roots are indeed suffixal morphemes which subsequently fused to the root to form a new triconsonantal root type. In other words, the C^0VRC^0/C^0RVC^0 - type is the result of transforming C^0VR-C^0 - (State I) and C^0R-VC^0 - (State II) through fusion of the suffixal element to the root. A Schwebeablaut root such as **pherk̑h-*/**phrek̑h-* goes back to an earlier root **pher-* and a suffix **ek̑h-* which formed a stem with two ablaut states: I, **pher-k̑h-*, and II, **phr-ek̑h-*. Thus we can represent all the unanalyzable stems of the second structural group as going back to sequences of root and suffixal morphemes in the two ablaut states:

<i>*t'e/orw-</i> / <i>*t'reu-</i>	⇐	<i>*t'e/or-u-</i> / <i>*t'r-eu-</i> ¹²
<i>*k̑'e/onu-</i> / <i>*k̑'neu-</i>	⇐	<i>*k̑'e/on-u-</i> / <i>*k̑'n-eu-</i>
<i>*k'oeru-</i> / <i>*k'oreu-</i>	⇐	<i>*k'oer-u-</i> / <i>*k'or-eu-</i>
<i>*se/onu-</i> / <i>*sneu-</i>	⇐	<i>*se/on-u-</i> / <i>*sn-eu-</i>
<i>*Hawi-</i> / <i>*Hwei-</i>	⇐	<i>*Haw-i-</i> / <i>*Hw-ei-</i>
<i>*k̑'enH-</i> / <i>*k̑'neH-</i>	⇐	<i>*k̑'en-H-</i> / <i>*k̑'n-eH-</i>
<i>*k̑herH-</i> / <i>*k̑hraH-</i>	⇐	<i>*k̑her-H-</i> / <i>*k̑hr-aH-</i>
<i>*phelH-</i> / <i>*phleH-</i>	⇐	<i>*phel-H-</i> / <i>*phl-eH-</i>
<i>*HerH-</i> / <i>*HreH-</i>	⇐	<i>*Her-H-</i> / <i>*Hr-eH-</i>
<i>*khoeiH-</i> / <i>*khoyeH-</i>	⇐	<i>*khoei-H-</i> / <i>*khoy-eH-</i>
<i>*Honr-</i> / <i>*Hner-</i>	⇐	<i>*Hon-r-</i> / <i>*Hn-er-</i>
<i>*werdh-</i> / <i>*wredh-</i>	⇐	<i>*wer-dh-</i> / <i>*wr-edh-</i>
<i>*k̑henth-</i> / <i>*k̑hneth-</i>	⇐	<i>*k̑hen-th-</i> / <i>*k̑hn-eth-</i>
<i>*Heugho-</i> / <i>*Hwegho-</i>	⇐	<i>*Heu-gho-</i> / <i>*Hw-egho-</i>
<i>*Hauk'-</i> / <i>*Hwek'-</i>	⇐	<i>*Hau-k'-</i> / <i>*Hw-ek'-</i>
<i>*werk̑'-</i> / <i>*wrek̑'-</i>	⇐	<i>*wer-k̑'-</i> / <i>*wr-ek̑'-</i>
<i>*pherk̑h-</i> / <i>*phrek̑h-</i>	⇐	<i>*pher-k̑h-</i> / <i>*phr-ek̑h-</i>
<i>*dheus-</i> / <i>*dhwes-</i>	⇐	<i>*dheu-s-</i> / <i>*dhw-es-</i>
<i>*thers-</i> / <i>*thres-</i>	⇐	<i>*ther-s-</i> / <i>*thr-es-</i>

This internal reconstruction of the antecedents of Schwebeablaut roots gives a fairly uniform picture of the structural morpheme sequences in early Proto-

11. The fusion of suffix and root to form a new unanalyzable root could take place when the derivational connections between source roots and derived stems were lost. For such morphological processes see Makaev 1970.

12. The symbol ⇐ indicates that the earlier source forms to the right are established by internal reconstruction.

Indo-European and their ablaut states, which are those described by Benveniste. The structural pattern he describes for Proto-Indo-European actually applies to various periods in the development of Proto-Indo-European. Benveniste's is an atemporal model for describing the structure of Indo-European morphemes and the mechanism for syntagmatically combining them, rather than a system of rules describing the mechanism at some specific stage in the development of the language.

Benveniste's classic model is of course not invalidated just because it does not correspond to one specific chronological stage in the development of Proto-Indo-European. Furthermore, it can be claimed that there was a stage in the development of Proto-Indo-European when the ablaut mechanism he described was dominant. In our view this was the stage preceding the formation of unanalyzable roots with Schwebeablaut. However, even for that stage Benveniste's model cannot be regarded as giving a completely adequate description of the Indo-European system, since for the individual C^0VC^0 -roots we have no factual evidence that both ablaut states occurred for any given suffix, much less for all of the suffixes. One stem may have had one ablaut state, while another had the other. Precisely this situation is reflected in the two root types II.1 and III.1 with their positionally fixed vowels.

In a number of instances it can be established that one of the ablaut states is younger than the other. Therefore for an earlier stage of the language we must assume that only one of the ablaut states existed for any such root; it alternated with zero grade, but not with the other ablaut state. The appearance of the other full grade and the formation of the full mechanism for Benveniste's ablaut alternations can be explained if we assume that the form with zero grade represented a neutralization of States I and II: then the productive system of vowel/zero alternations would give rise to the missing ablaut states.

For example, a stem with two ablaut states ***phel-H-** (Skt. *pārī-man-* 'fullness') and ***phl-eH-** (Skt. *prāyaḥ* 'for the most part') appears in zero grade as ***phl̥-H-** (Skt. *pūrṇá-* 'full'), which neutralizes the State I/State II opposition of the full grade. It can represent the zero morphophonological variant of both State I and State II.

Thus the zero grade can be seen as ambiguous, deriving from either State I or State II. This fact made it possible for State I or II, whichever had been missing, to be created out of the vowel/zero alternations for any root. The newly created ablaut forms filled the gaps in the previous ablaut patterns.

For example, the stem ***pherķh-**, with the probably newer State I ***pher-ķh-** (Lith. *peršũ* 'I ask in marriage', see Anttila 1969) and older State II ***phr-eķh-** (Skt. *praśná-*), acquired the status of a stem with two ablaut states when the innovative State I was created from the zero-grade form ***ph̥r-ķh-** (Skt. *pr̥cchāti*, Lat. *poscō*) by applying to it the productive vowel/zero alternations.

Following the model shown in Figure 1, defective sets were transformed by creation of the missing State I or II, as shown in Figure 2.

Figure 1
Model for the ablaut alternation of State I or II with zero

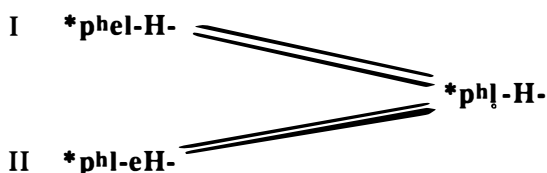
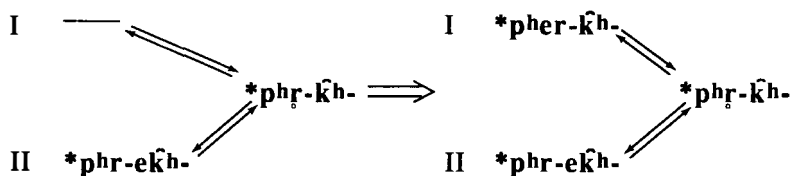


Figure 2



This pattern accounts for the secondary development of ablaut State I or II in a number of Indo-European roots.

4.2.6. *Roots ending in *-i- and *-u-, the more recent ablaut State I, and the question of ancient, nonapophonic *-i- and *-u-*

State I is the more recent form in nominal derivatives of PIE ***dhw-es-** (Gk. *theós*, Lat. *bēstia*). The State I form, ***dheu-s-**, is attested only in Balto-Slavic and Germanic: Lith. *daūsos* 'paradise, tropical countries', OCS *duxŭ* 'breath, spirit', Goth. *dīus* 'wild animal'. We can assume that State I in this form was a relatively recent dialectal feature, restricted to this one areal group of dialects. The same interpretation can be given to the State I form ***kʰoēi-H-** of the root ***kʰoy-eH-** (Avest. *šyāta-* 'gladdened'): OCS *pokoji* 'quiet, peace' beside the zero grade of *počiti* 'rest'.

There are also ancient Indo-European roots which are interesting in this regard: ***ǵhei-mo-** 'winter' (Lith. *žiemà*, OCS *zima*) and ***t'eiw-o-** 'god' (Skt. *deváh*, Lat. *deus*, OIr. *dia*, Lith. *diēvas*). The Proto-Indo-European forms of these roots already had fully developed ablaut alternations following Benveniste's model:

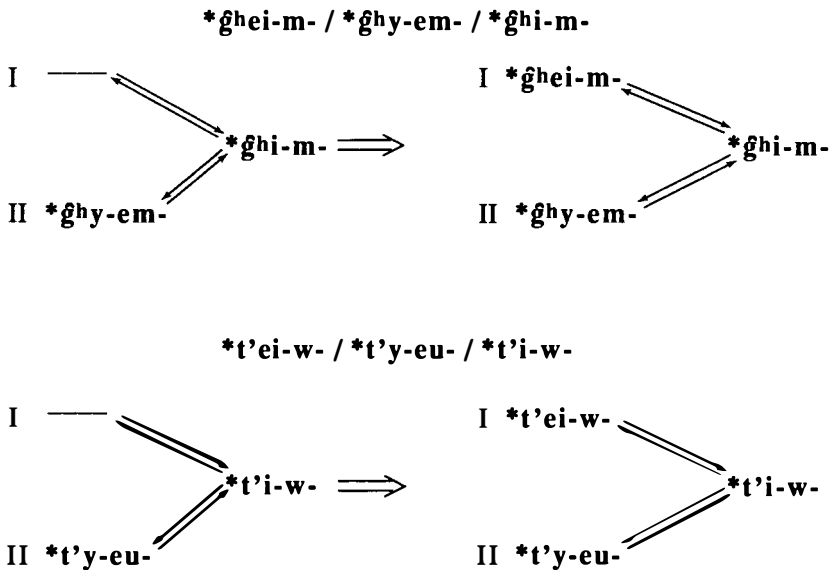
State I
***ǵhei-m-**
***t'ei-w-**

State II
***ǵhy-em-**
***t'y-eu-**

Forms showing State II are Lat. *hiems* 'winter', Gk. *khiōn* 'snow'; Skt. *dyáuḥ* 'sky', Gk. *Zeús* (State I forms are cited just above).

The State I forms are derived with the thematic suffix, which shows that they are more recent than the State II forms. The source for the State I forms must have been the zero-grade forms: **ǵhi-m-* (Skt. *himá-* 'snow, freeze', Avest. *zəmaKa-* 'snowstorm', Gk. *dús-khimos* 'winter [adj.]': see Kuryłowicz 1973b:65) and **t'i-w-* (Skt. *div-*, *divyá-* 'divine', Gk. *dīos*, Lat. *dīus* < **diwyos* 'divine', cf. Luw. *Tiwa-* 'sun god'): Osthoff 1881, Anttila 1969:164, Szemerényi 1959:107ff., 1970. Therefore the earliest Indo-European ablaut forms of this root were **ǵhy-em-* / **ǵhi-m-* and **t'y-eu-* / **t'i-w-*, with no State I; the State I form arose later, created by the productive mechanism of ablaut alternations. This is shown in Figure 3.

Figure 3



This means that the oldest root morphemes for these forms were not **ǵhei-/*ǵhi-* and **t'ei-/*t'i-* (i.e. CVR-/CR₂-), but rather **ǵhi-* and **t'i-*, i.e. *Ci*. Such structures depart from the basic CVR- canonical root morpheme shape of Indo-European. The **i* in the roots **ǵhi-* and **t'i-* probably reflects the ancient vowel phoneme **/i/* of the original vowel triad **/i u *V/* (for forms with stable **i* such as **kʰoi-s* and the locative **i-* see I.3.1.2 above).

The fact that we find this vowel after a root consonant means that we can

now also reconstruct roots of the shape CV- for earliest Indo-European. The *-i* of such roots (and probably also *-u* of others) took the nonsyllabic form *y* (or *w*) when a suffix beginning in a vowel was added to produce Ci-VC: **ǵhi-* + **-em-* ⇒ **ǵhy-em-*; **t'i-* + **-eu-* ⇒ **t'y-eu-*. This process would naturally have facilitated the alternation of *-i-* with *-y-* (and *-u-* with *-w-*) that gave phonemic status to the sonants /**y*/ and /**w*/ with allophones [i, y] and [u, w] when their nonsyllabic allophones merged with the earlier /*y*/ and /*w*/. Once these roots were perceived as ending in a sonant, /**y*/, a vowel could easily have been inserted into the root in accordance with the productive ablaut mechanism:

$$*t'i- \Rightarrow *t'ei- \quad *ǵhi- \Rightarrow *ǵhei-$$

The same explanation accounts for the appearance of full grade in the dialect form **dheu-s-* discussed above. For an earlier stage we can reconstruct the form **dhw-* for this root, with a final non-alternating **-w-* which in all likelihood goes back to the original vowel **u*.

Further evidence of the original vowel phonemes **i* and **u* can be seen in the stable *i* and *u* of late Proto-Indo-European. At that time they were already syllabic allophones of the sonants /*i*/ and /*u*/, but they reveal their originally vocalic status in the absence of other ablaut grades (see Schmitt-Brandt 1967:21ff.).

Examples of stable *i* and *u* include Proto-Indo-European roots with stable **u* that does not alternate with **-eu-*: **ǵh₂won-* 'dog' (Gk. *kúōn*, Skt. *ś(u)vā*, Lith. *šuo*, Hier. Luw. *suwana-* 'dog'); **d_hugh₂H₂ther-* 'daughter' (Gk. *thugatēr*, Skt. *duhiā*); stable **u* also occurs in the preverb **uth-* / **ut'-*: Skt. *út-*, *úd-* 'up, above', Avest. *us-*, *uz-*, Gk. *u-* in *húbris* 'pride, arrogance', *hústeron* 'later', Lat. *us-que*, Goth. *ūt*; Lith. *úž*, OCS *vŭz-*. Cf. also the *nomen actionis* suffixes **-ti*, **-tu* of Gk. *phúsis* 'nature', Skt. *bhū-tí-* 'becoming'; **-ri*, **-ru* as in Hitt. *etri* 'food', Lith. *ėdrūnas* 'voracious'; and the suffix **-bhi* of the oblique cases: Skt. *-bhi*, Gk. *-phi*, Myc. *-pi*.

We can see the same original vowel **i* in the non-alternating suffix of archaic nominal roots in *-i* such as Skt. *pāti-* 'master', gen. *pátyuḥ* (cf. Lat. *potis*, Gk. *pósis*, Hom. gen. *pósios*), *ávi-* 'sheep', gen. *ávyah* (Gk. *ówis*, gen. *oiós*; Lat. *ouis*, gen. *ouis*), *aríḥ* 'stranger, alien', gen. *aryáh* (Szemerényi 1970:163ff.).

We find the same type of inflection in a few nominal roots in *-u-*, where the stable, non-alternating *u* reflects an originally vocalic phoneme: Skt. *mádh_u* 'honey' (Ved. gen. *mádh_uas*, *mádh_uas*, cf. Gk. *méth_u* 'wine'; Skt. *paśú-* 'livestock', Ved. gen. *paś_uváh* (cf. Lat. *pecū* 'cattle', gen. *pecūs*), Goth. *faíhu*; Skt. *hánu-* 'chin', instr. *hánuā*, Avest. *zānu-*, Gk. *gén_us*, gen. *gén_u(w)os*, Goth. *kinnus* 'cheek'.

Hittite nominal roots in *-i* and *-u* which lack full-vowel ablaut grades belong

to the same type: Hitt. *aššu* 'good', dat.-loc. pl. *aššuwaš* 'good'; *kutru-* 'witness', dat. *kutruī*; *weši-* 'pasture', instr. *wešiyaz*; etc.

These instances of *i* and *u* gradually lost their vocalic status as full grade intruded into the original paradigms and the syllabic and nonsyllabic elements underwent allophonic redistribution. In addition to the ancient paradigms with non-alternating *-i* and *-u*, new forms with full grade of suffixal *-i* and *-u* arose in some languages: Skt. *pātiḥ* 'master', Ved. dat. *pátīye* (RV) beside later *pátaye* (AV); *paśúḥ* 'livestock', dat. *pásve* (three times in RV) beside the later *paśáve* (once in RV); *mádhu* 'honey', gen. *mádhvas*, *mádhvas* beside later *mádhos* (see Kuiper 1942).

Hittite underwent further systemic redistribution of the ablauting and non-ablauting types of the suffixes *-u-* and *-i-*. The ancient forms without ablaut were standard in nouns, while the ablauting types became typical of adjectives: cf. *aššu* 'good (noun)', dat.-loc. pl. *aššuwaš*, vs. *aššuš* 'good (adj.)', gen. *aššawaš*; analogously, *parku-* 'high', gen. *pargawaš*, *panku-* 'all', gen. *pangawaš*, etc.

The same formal opposition appears in *-i* stems: Hitt. *weši-* 'pasture', instr. *wešiyaz*, but *šuppi-* 'clean', gen. *šuppayaš*, *ḫarki-* 'white', gen. *ḫarkayaš*, etc.

In Sanskrit, in contrast to short *-i-*, *-u-*, the long suffixal *-ī-*, *-ū-* from **iH-*, **uH-* are more conservative and show no secondary forms with full grade: cf. *devī* 'goddess', gen. *devyāḥ*, *tanūḥ* 'deed', gen. *tán(ú)vaḥ*, etc.

4.2.7. Indo-European root morpheme structures with initial or final vowel: VC^0- , C^0V-

For earliest Proto-Indo-European we can posit root morpheme structures of the form C^0V- , where the vocalic element could be represented by the vowels *-i-* and *-u-* (as well as **V*). This was a regular structural type for pronominal bases. It is also reflected in verbal endings such as **-Ha* (1sg. perf., cf. Luw. *-ḫa*, 1sg. pret.), **-thHa* (2sg. perf.). This establishes that the same morpheme structure was shared by morphemes with different grammatical functions: nouns and verbs, pronouns, endings, and also preposed elements such as the negative *ne*, the preverb *pe-*, and others.

Another root shape also shared with affixal morphemes is VC^0- . It is attested in some of the earliest Indo-European formations (Types IV.1, IV.2 above). All the historically attested Indo-European languages, including Hittite, show an initial vowel in these forms. Therefore there is no justification (structural or other) for considering such roots as derived from $C^0_1VC^0_2-$ via loss of the initial consonant. But that is the theory of Benveniste and Kurylowicz, who posit an initial laryngeal for most of the VC^0- root shapes. Now, some VC^0- structures in the attested languages do go back to the standard $C^0_1VC^0_2-$, with loss of an initial laryngeal, obstruent, or sonant for which there is clear evidence

in some Indo-European dialects.¹³ However, given the variety of original root shapes that can be observed in Indo-European, it would be unjustifiable to reduce the VC⁰- type to some other in the absence of unambiguous evidence for this in the historically attested languages.

Roots of this structure include the ancient Indo-European verbal roots *es- 'be', *et- 'eat', *ekho- 'drink', *eph- 'take, grasp', *er- 'move, get up', *ei- 'go'. An initial laryngeal for these roots is not supported by Hittite data, where they appear as the alternating singular and plural forms *eš-/aš-*, *et-/at-*, *eku-/aku-*, *ep-/ap-* — without the initial *h-* that we would expect if there had been a laryngeal in these roots.¹⁴ The singular-plural alternation reflects the Indo-European alternation of full and zero grade: cf. Skt. 3sg. *ásti*, 3pl. *sánti*, Lat. *est*, *sunt*, OCS *jesti*, *sqti*. The *a* vocalism in the Hittite plurals is the functional correspondent of zero grade (cf. the normal Hittite alternation of *e* and zero in sg. *huk-* 'charm, bewitch', pl. *huk-*, sg. *kuen-* 'kill', pl. *kun-*, etc.), created by reshaping of the original vowel-zero alternations. Such an *a* could have developed in zero-grade forms from the reduced vowel that would have appeared in initial position in zero grade.

In Greek, *e* grade was restored in plural forms as early as Homer.¹⁵ The full vowel quality of the Hittite plurals in *a* could be due to assimilation to the vocalism of the endings 1pl. *-we/ani*, 2pl. *-te/ani*, 3pl. *-anzi*.¹⁶

a vocalism in forms functionally corresponding to zero grade also appears in other languages: cf. Lat. *apīscor* 'I reach, attain', *āptus* 'convenient', OLat.

13. In addition to the loss of an initial laryngeal (traces of which are preserved as *h-* in Hittite), and in addition to the examples cited in I.2.4.6 with posited postvelars and spirants, there are also losses of initial *w* (see Gercenberg 1972:145-46) and *y*. The Indo-European word for 'good' is traditionally reconstructed as **esu-* (Gk. *eús* 'good, noble', *el-* 'good, noble' in compounds; Hitt. *aššu-* 'good'). There is an Anatolian form *wašu-* (Hier. Luw. *wasu*, Luw. *wašu-*, Pal. *wašu-*) which is cognate to Hitt. *aššu-* and supports the claim of Schwyzler 1939:I.421 that these forms are all cognate to Skt. *vásu-*. For Indo-European the reconstructed form is **wesu-*. Hittite shows *o* grade, unlike Gk. *eús* and probably Skt. *vásu-*. The initial *w* was lost in Hittite, as in Greek, in prehistoric times. The zero-grade form appears in Indic, in compounds with initial *su-* (Gamkrelidze 1960:69-70), cf. Gk. *hugiēs* 'healthy' (< *'living well': Schwyzler 1939:I.298, Boisacq 1916:997); see Puhvel 1980. The protoform for Lat. *equus* 'horse', Skt. *áśva-*, Avest. *aspa-*, Gaul. *epo-*, OE *eoh*, Lith. *ašvā*, comparable to Gk. *hippos* (Myc. *i-ko* 'horse'), can be reconstructed as **ekhwo-*. However, the initial *i* and aspiration of the Greek form may also point to **yekhu(o)-*, with an initial sonant *y* which can also be seen in Toch. B *yakwe*, A *yuk* (the *y-* of the Wakhi and Ossetic words is probably secondary).

For loss of initial *y-* in Hittite cf. Hitt. *ekuna-* 'cold' beside Olcel. *jaki* 'ice floe', Mlr. *aig* 'ice', PIE **yekh-*.

14. 3sg. *e-eš-zi* 'is', 3pl. *a-ša-an-zi*; 3sg. *ez-za-zi* 'eats', 3pl. *a-da-an-zi*; 3sg. *e-ku-zi* 'drinks', 3pl. *a-ku-a-an-zi*; 3sg. *e-ip-zi* 'grasps', 3pl. *ap-pa-an-zi*; cf. 1pl. *a-tu-e-ni*, *a-ku-e-ni* in early texts (KBo XVII 1+III 15 I IV 6 II 13, see Otten and Souček 1969).

15. Cf. the Homeric plurals: 1pl. *eimén*, 2pl. *esté*, 3pl. *ēāsi* beside 1sg. *eimí*, 2sg. *ess(t)*, *ēís*.

16. The endings 1pl. *-wani*, 2pl. *-tani* already occur with certain verbs in Old Hittite; they reflect assimilative processes that took place in prehistoric Hittite. For these endings in Old Hittite see Otten and Souček 1969:79.

coēpī 'I began', Hitt. *appant-* 'captive'; Lat. *aqua* 'water', Goth. *ahva* 'river', Hitt. *akkuwant-* 'having drunk'; cf. also the initials vowel of Gk. *odōn* 'tooth', Arm. *atamn* 'tooth', Hitt. ppl. *adant-* 'eaten; having eaten' from *et-* 'eat', and the zero forms of Skt. *dán*, *da(n)t-* 'tooth', Avest. *dantan-*, Lat. *dēns*, gen. *dentis*, OIr. *dét*, Lith. *dantis*.

Having posited an archaic root structure VC^0 -, we can now propose a mono-consonantal root type $-C^0$ - for earliest Indo-European. The shape VC^0 - would have been one of its ablaut states when the mechanism of ablaut alternations later arose:

*s- : *es-	'be'
*t'- : *et'-	'eat'
*kho- : *ekho-	'drink'
*ph- : *eph-	'take, grasp'
*r- : *er-	'move, get up'
*i- : *ei-	'go'

4.2.8. Internal reconstruction of the earliest syntagmatic combinations of morphological elements; rules for generating them

For early Indo-European we can distinguish three basic root structures: C^0_1V -, VC^0_1 -, and $C^0_1VC^0_2$ -. C^0 in these structures can be represented by a cluster: C^0_1 can be represented by CR (in an open syllable), and C^0_2 by RC (in a closed syllable). The initial consonant could also be the cluster sC^0 . At this chronological stage, V could be any of the three vowels of the pre-Indo-European triangular system $e \sim a \sim o$, i , and u . The structural types $-C^0V$ - and $-VC^0$ - evidently included affixal morphemes as well as roots.¹⁷

The type C^0VC^0 - comprised mostly root morphemes. However, although the main canonical shape for affixal morphemes was VC^0 -, a few had the shape $-C^0VC^0$ -. Suffixes of this form included the agentive **-ther-* (Skt. *damitā(r)* 'tamer', *janitā(r)* 'parent', Gk. *genētōr*), **-thel-* (Hitt. *aršaniyatalla-* 'envious person', OCS *dělatelī* 'laborer, peasant', etc.), and some plural verb endings (Gk. 1pl. *-men*, e.g. *légomen* 'we speak'; Hitt. 1pl. past *-wen*, e.g. *dawen* 'we took'; 2pl. *-ten*, e.g. *datten* 'you took'; 1pl. Gk. *-mes*, Skt. *-mah*, etc.).

These structures can be analyzed on comparative evidence into constituent elements: $-C^0V-C^0$ - and $-C^0-VC^0$ -, where one of the components has zero grade — a fact which shows that these suffixes were morphologically complex at the

17. Consequently, part of the root structure types II ($C^0_1VRC^0_2$ -) and III ($C^0_1RVC^0_2$ -) of 4.1.1 above can be reduced to the type I ($C^0_1VC^0_2$ -) together with IV (VC^0 -), with ablaut alternation of full and zero grades. The sporadically attested type VII (C^0RV -) can in some cases be reduced to an earlier VI (C^0V -, where C^0 is a labialized obstruent: see I.2.4.3 above).

Proto-Indo-European stage.¹⁸ They fused into unitary suffixal morphemes in the individual Indo-European dialects.

This origin of the C^0VC^0 - suffixes provides grounds for internally analyzing the root shape $C^0_1VC^0_2$ - as also originally complex, formed by juxtaposition of structures of the shape C^0_1V - and $-VC^0_2$ - with zero grade of one of the morphemes.¹⁹ That this analysis is plausible can be shown by examining unusual root structures as in Skt. *unáti* 'sprinkles with water', which can be analyzed into **u-n-at-ti* (see Strunk 1972:175), pl. *u-n-d-áti* (PIE **u-n-et'-thi*/**u-n-t'-ṇthi*): cf. Lat. *unda* 'wave' (*u-n-d-a*), Lith. *vanduō* 'water'. It is related to the root **wet*- 'water', Skt. loc. *udáni* 'in the water' (cf. Hitt. loc. *weteni* 'in the water'), *udā* 'waters' (neut. coll. pl.). Comparing these forms, we can distinguish an initial **w* and a second, derivational, element **et*- in **wet*- (the initial laryngeal posited by Benveniste 1955:189 only on the basis of Avest. *aōda*- 'spring' has no solid justification). This segmentation is also supported by comparing the Sanskrit forms to Skt. *vār*- 'water', Toch. A *wār*, B *war* 'water'. An archaic monoconsonantal root structure is also apparent in stems with a nasal affix such as Skt. *unābdi* 'ties' < **u-n-ebh-thi* (see Strunk 1972:175) and Indo-European formations like **(e)l-eu-dh-* (Gk. *eleútheros* 'free', Lat. *liber* 'free', Slav. *ljudŕje* 'people', Goth. *liudan* 'grow': see Duhoux 1973).

This diachronic interpretation of the $C^0_1VC^0_2$ - root structure as derived from $C^0_1V-C^0_2$ - or $C^0_1-VC^0_2$ - allows us to reduce the possible structural types to two basic forms: an open syllable $-C^0_1V$ - and a closed syllable $-VC^0_2$ -. All of the more complex structural forms are the result of compounding of these basic structures in one or another order. A basic tendency in the morpheme compounding of early Indo-European was a principle of regular alternation of open and closed syllables, whereby in a morpheme sequence an open-syllable morpheme was always followed by a closed-syllable morpheme, while after a closed-syllable morpheme or word-initially either syllable type could occur.

18. Further evidence for the complex nature of these suffixes is the correlation of *-ther*- and *-th-* in Sanskrit compounding (Wackernagel and Debrunner 1930:III); the correlation of **-ther*- and **-then*-, especially in the heteroclitc paradigm with **-r*/**-n*-, cf. the Hittite stems in *-tar*: *papratar* 'ritual uncleanness', gen. *paprannaš* < **paprtnas*; *idalawatar* 'evil', gen. *idalawannaš*. On the other hand, the correlation of **-ther*-/**-then*- with **-thel*- in Indo-European indicates that it can be segmented into **-th-er*-/*-en*-/*-el*. Further evidence for analyzability is the correlation of **-men*-, **-then*-, **-mes* with pronominal bases at the proto-language level: we can segment out **-me*-, **-the*-, and **-en*-, **-es*; one of the two constituent elements shifts to zero grade when the compound suffix is formed.

19. The origin of $C^0_1VC^0_2$ - from a sequence of two morphemes explains the occasional clear violations of the constraint against occurrence of identical consonants within the root. These (rare) cases may reflect the time when $C^0_1VC^0_2$ - was perceived as consisting of more than one morpheme. Relics of this type can be seen in roots such as **ses*- 'sleep, rest' (Skt. *sás*- 'sleep', Hitt. *šeš*- 'sleep, rest'). It cannot be ruled out that **ses*- was originally a reduplicated form of a monoconsonantal **s*- 'lie' (for reduplications see 4.1.3 above; 'sleep' would belong to the type with *e* vocalism).

If C^0VC^0 - is interpreted as an earlier sequence of root and suffix, C^0-VC^0 -, then we could set up a large group of monoconsonantal verb roots, traces of which can be seen in late Indo-European verb forms of the type VC^0 -.

The generation of the complex morpheme sequences required for this structural system can be described in the following three cyclical rules:

Rule 3: In a morpheme sequence, an open syllable C^0V- can be followed only by a closed syllable VC^0- .

Rule 4: In a morpheme sequence, a closed-syllable morpheme VC^0- can be followed by either an open-syllable morpheme C^0V- or another closed-syllable morpheme VC^0- .

Rule 5: The initial element of a morpheme sequence can be either an open-syllable or a closed-syllable structure.

Multiple application of rules 3 and 4 to any initial element can produce a morpheme chain of any length, using the morphemes known to underlie the elements reconstructed for late Indo-European. Figures 4 and 5 show the generation of morpheme chains.

Figure 4

Generation of a morpheme chain with an initial open syllable

$$C^0_1V - VC^0_2- \left\{ \begin{array}{l} VC^0_3- \left\{ \begin{array}{l} VC^0_4- \{ \\ C^0_4V- \end{array} \right. \\ C^0_3V- \quad VC^0_4- \{ \end{array} \right.$$

Figure 5

Generation of a morpheme chain with an initial closed syllable

$$VC^0_1- \left\{ \begin{array}{l} VC^0_2- \left\{ \begin{array}{l} VC^0_3- \{ \\ C^0_3V- \end{array} \right. \\ C^0_2V- \quad VC^0_3- \{ \end{array} \right.$$

The morpheme sequences so generated undergo morphophonemic fusion of adjacent homogeneous vowels or syncope of one of two vocalic elements of adjacent morphemes (the prototype of zero ablaut grade: cf. the syncope rule of Borgström 1949, 1954). This syncope can be seen as reflecting a principle of monovocalism whereby only one morpheme in a morpheme sequence can have a vocalic element (see 4.2.1 above). We can see the effect of the monovocalism

principle in certain archaic formations which have only one morpheme in normal grade: Skt. 3pl. *undāti* 'sprinkles with water', from ***u-n-t'-ṇthi**; Skt. *pr̥thúh*, Gk. *platús* 'wide' from ***ph̥l̥-th-H-eu-/ *ph̥l̥-th-H-u-**.

The rules for syntagmatic combination of morphemes in a complex morphemic string can explain the origin of multimorphemic late Indo-European forms such as:

- I **t'i-eu-yo-os* ⇒ PIE ***t'iwyos** (Skt. *divyáh*, Gk. *dĩos*, Lat. *dĩus* 'divine')
 ġhi-em-eu-en-eth-os* ⇒ *ġhimowonthos** (Skt. *himávant-* 'snowy, icy; Himalayas')
 t'e-er-ekh-ei-o-thi* ⇒ *t'erkh-eyo-thi** (Skt. *darśáyati* 'shows')
 phre-ekh-eš-khe-mi*²⁰ ⇒ *phrek̥h-š̥k̥he-mi** (Skt. *pr̥cchāmi* 'I ask')
 bhe-eudh-o-m(a)i* ⇒ *bheudh-o-mai** (Gk. *peúthomai* 'I notice, observe', Skt. *bódhate* 'stays awake')
 phHe-the-er-bhi-om* ⇒ *ph̥H̥ther-bhy-om** (Skt. *pitṛbhyām*, dat.-instr. du.)
- II *(*e*)*t'-me-en* ⇒ PIE ***et'-men** (Skt. *ádman* 'food')
 *(*e*)*t'-ri* ⇒ ***et'-ri** (Hitt. *etri* 'fodder, food')
 *(*e*)*t'-mi* ⇒ ***et'-mi** (Skt. *ádmi*, Hitt. *e-it-mi*)
 *(*e*)*s-en-thi* ⇒ *(*e*)**s-onthi** (Hitt. *ašanzi*, Skt. *sánti*, Lat. *sunt*)

4.2.9. The development of archaic Indo-European morpheme structures

The preceding sections have presented a diachronic interpretation of the late Indo-European morpheme structures, reducing them to two basic formal types plus rules for syntagmatic combinability applying to complex morpheme sequences. On this basis we can use internal reconstruction to establish a very early stage of Proto-Indo-European, one in which the structure of a morpheme was not determined by its function: root morphemes (nominal and verbal) and affixal morphemes both had the same structural types.

This structural nondifferentiation may be a reflex of the functional nondifferentiation in the morphemes of various classes that was typical of earliest Indo-European. The subsequent formal differentiation of morphemes of various functional classes — root morphemes, suffixal morphemes, endings — results from the fusion of C⁰V-VC⁰- sequences into root morphemes of the shape C⁰₁VC⁰₂-, formally distinct from the original general morpheme shapes C⁰V- and VC⁰-. Only a small part of the VC⁰- structures continue the structural

20. Initial morphemes containing consonant sequences (like **phre-* in this word) may also be analyzed into an earlier C⁰-C⁰V-.

nondifferentiation of functionally different morphemes. On the other hand, C^0V - shapes of endings and pronominal bases are preserved when an open-syllable morpheme is at the end of a morpheme string.

The structures surveyed above are deep reconstructions of the original Indo-European root structure, based entirely on purely formal correlations among the various types of morpheme structures reconstructed for late Indo-European. Theoretical constructions of this type have a certain amount of explanatory power, since they reduce the structures observable in the Indo-European protolanguage to a minimal number of types, from which generative rules can derive the attested structures (cf. Borgström's structures proposed for early Proto-Indo-European). It is important to keep in mind that deep internal reconstructions vary in the extent to which they are hypothetical. For instance, the reduction of triconsonantal roots with Schwebelablaut to earlier stems in Benveniste's States I and II is less hypothetical than the further reduction of biconsonantal roots to an earlier sequence of C^0V - and VC^0 - morphemes; the latter are extremely hypothetical.

However, despite their varying hypotheticality these structures share the principle of internal structural analysis, since they reflect various chronological stages in the history of Proto-Indo-European. The model posited for the earliest stage represents one of the possible ways in which the Proto-Indo-European ablaut mechanism and the late Indo-European rules for syntagmatic combinability of morphemes into complex sequences could have come about.

Thus the chronological stratification in the morpheme structures observed for late Proto-Indo-European and surveyed as Types I-VII in 4.1.1 above allows those structures to be viewed as the result of repeated overlappings of structural types and reductions of those types to a unified system. This began in the earliest stage, when the vowel system consisted of *V*, *i*, and *u* and the consonants included sonorants. Subsequently, the class of sonants formed and the vowel system took the form of *e*, *a*, and *o*. This led to redistribution of morpheme structures and the association of certain morpheme shapes with roots and others with affixes, classes which had been formally undifferentiated at the earliest stage of Proto-Indo-European.

4.3. Typological perspective on the reconstructed Proto-Indo-European morphophonological structure

4.3.1. Canonical forms of root morphemes in Proto-Kartvelian compared with Indo-European

The system of morphophonological alternations and root structures reconstructed above for late Common Indo-European can be typologically compared

to the models reconstructed for Common Kartvelian. The basic Common Kartvelian models for root and morpheme structures and their rules for syntagmatic combinability show a striking typological parallel to the structural models we have proposed for late Indo-European. It can be claimed that the Indo-European morphophonological system is isomorphic to that of Common Kartvelian (Gamkrelidze and Mačavariani 1965).

The canonical formula for the Common Kartvelian root morpheme is $C^0_1VC^0_2$ -, where C^0 can be replaced by any consonant, including a nonsyllabic resonant (R). Consequently we have the following possible root types: CVC-, CVR-, RVC-, and RVR-, with a short vowel V (a cover symbol for **e*, **a*, or **o*) between the two consonants. There are certain constraints on the C^0VC^0 -root structure:

- (1) No root can contain two stops of the same point of articulation.
- (2) No root can contain two glottalized consonants (see also I. Melikišvili 1980).

These are analogous to (a) and (c) for Indo-European, given in I.2.6.1 above. The rules of Kartvelian proper do not preclude cooccurrence of identical consonants, including ejectives, within the root; in this respect the Kartvelian constraints differ from the Indo-European ones.

The basic structural types for late Proto-Kartvelian roots are the following:

I. CVC-:

**tes-* 'sow'

**t'ep-* 'make warm, get warm' (Geo. 1sg. aor. [*gan-*]-*v-t'ep* 'I got warm', 3p. *gan-t'p-a*, OGeo. *t'p-il-i* 'warm', mod. Geo. *tb-il-i*, Mingr. *t'ibu*; cf. PIE **theph-* 'warm' with the same formal structure, I.2.6.3 above)

**q'ed-* 'go, move'

**k'ač-* 'husband, man'

II. CVR-:

**ber-* 'blow'

**ban-* 'wash'

**qan-* 'plow' (cf. **qar-* 'bull')

**čol-* 'woman'

III. RVC-:

**wed-* 'go'

**rek-* 'shake'

**wač-* 'goat'

IV. RVR-:

wal-* 'go'jor-* 'two'

In addition to the basic root form C^0VC^0 -, late Proto-Kartvelian had other structural types, CVRC- (**zard-* 'grow, raise'), CRVC- (**xleč-* 'cut apart'), VC- (**aš-* '100'), VRC- (**ert-* 'one'). The type with initial vowel is found only in nominal bases and not in verbal stems, which generally had initial consonants. For such cases we can posit loss of an initial nonsyllabic element from the root structure. The same can also be assumed for Indo-European VC^0 - structures, which could appear in both verbal and nominal bases in Indo-European.

On the other hand, $-VC^0$ (i.e. -VC or -VR) is canonical for suffixal morphemes (as in Indo-European):

-VC: **-ed*, **-et'*, **-et*, **-eb*, **-ek'*, **-eš*, **-eš*, **-ež*, **-ex*

-VR: **-el*, **-er*, **-en*, **-em*, **-ew*, **-ej*

The shapes C^0V - (i.e. CV- and RV-) and CRV- are found primarily in pronominal bases and in certain adverbial bases and participles in Kartvelian (for the similar pronominal bases of Indo-European see 4.1.1 above, Type VI):

Personal pronouns		Possessive pronouns	
singular	plural	singular	plural
1p. <i>*me-[na]</i>	<i>*č-we-[na]</i> (incl.) <i>*na-</i> (excl.)	<i>*č-we-m-</i>	<i>*č-we-n-</i>
2p. <i>*š-we-[na]</i>	<i>*štk-we-[na]</i>	<i>*š-we-n-</i>	<i>*štk-we-n-</i> (Gamkrelidze 1959)

Demonstrative pronoun:

**ma-*

Adverbial bases:

**že* 'up'

**kwe* 'down'

Particle:

**we-* negative

The negative particle **we-* 'not' occurs in its zero-grade form **u-* as the first element in compounds; cf. the Indo-European negative particle **ne* 'not' (Skt. *ná*, Lat. *ne-*, Gk. *ne-*, Goth. *ni*, Hitt. *natta*, *nawi*, OCS *ne*) with its zero grade **n-*

as first element of compounds (Skt. *a-*, Gk. *a-*, Lat. *in-*, Goth. *un-*): Gamkrelidze and Mačavariani 1965:323.

There is also a marked formal similarity between the Proto-Kartvelian pronominal system and that of Indo-European (particularly the unstressed personal pronouns):

Indo-European personal pronouns (unstressed)		Indo-European possessive pronouns	
singular	plural	singular	plural
1p. <i>*me</i>	<i>*we</i> (incl.) <i>*ne</i> (excl.)	<i>*[m]eme</i>	<i>*_hsme</i>
2p. <i>*the</i>	<i>*ywe-</i> , <i>*swe-</i> ²¹	<i>*th(e)we</i>	<i>*sw(e)me</i> ²²
(stressed)			
1p. <i>*m-mé</i>	<i>*_hs-mé</i>		
2p. <i>*th-wé</i>	<i>*us-mé</i>		
3p. <i>*s-wé</i>			

(Cowgill 1965:169-70)

In addition to the multiconsonantal root types of Proto-Kartvelian, there are a number of monoconsonantal C⁰- root shapes, primarily in verbal roots. This root type gives Kartvelian affinities to North Caucasian. It can be compared typologically to the monoconsonantal verb roots posited for Indo-European in 4.2.7 above. Kartvelian examples:

**b-* 'tie' (3sg. pres. Geo. *a-b-am-s*, Svan *a-b-em*, Mingr. *gi-o-b-u-[n]*)

**g-* 'build' (3sg. pres. Geo. *a-g-eb-s*, Mingr. *o-g-an-s*, Svan *a-g-em*)

**r-* 'be' (1sg. pres. Geo. *v-a-r*, Mingr. *v-o-r-e-k*, Laz *v-o-r-e*, Svan *xw-ā-r-i*)

**ʒ-* 'lie' (3sg. OGeo. *ʒ-e-s*, Mingr.-Laz *ʒ-u-[n]*, Svan *z-i*)

4.3.2. *Structural evidence for velarized and labialized consonants in Proto-Kartvelian, and their typological analogs in Indo-European*

In all the root morpheme types surveyed above, the single nonsyllabic element

21. **swe-* can be assumed on the basis of Hitt. *šummeš*, OIr. *sí*, *sissi* 'you (pl.)', *úai-b* 'your', Welsh *chwi* 'you', Goth. *izwis* 'you' (Pokorny 1959:514).

22. For the reconstruction of the singular forms and first-person plural see Schwyzler 1939:I.608; the second-person plural is based on Hittite *-šmi-* 'your' in comparison to Greek.

-C⁰- can be represented by what are known as decessive harmonic clusters²³ or by labialized clusters of the form -C⁰w- (where C⁰ itself may be a decessive harmonic cluster). Thus harmonic clusters and C⁰w clusters constituted homogeneous units that were functionally equivalent to single consonants. Only one such cluster per root is permitted. Examples:

*č'q'al-	'favor'	*šwed-	'remain, be left'
*rečx-	'wash'	*šwer-	'get tired'
*t'q'aw-	'hide, skin'	*žwar-	'stake'
		*leyw-	'fig'

*č'w- 'burn, ignite': Geo. 3sg. pres. *c'w-av-s* 'burns', Mingr.-Laz *do-b-č'v-i* 'I burned', Svan *a-č'-i* 'bakes'

*šw- 'drink': Geo. 3sg. pres. *sw-am-s*, Mingr. *šu-n-s*, Svan past *x-ō-šw-a*

*tx- 'seek, ask': Geo. 3sg. *s-tx-ov-s* 'asks', Mingr. *tx-u-al-a* 'request, favor', Svan 3sg. *x-e-tx-ēl-i* 'seeks'²⁴

The structural and distributional properties of harmonic and labial clusters allow us to interpret them as historically monophonemic units. They are distributionally identical to single consonants and sonants in roots because they were historically identical to them in their paradigmatic function. They must have been complex consonants that took the place of single consonants in the root. This monophonemic interpretation of such clusters makes it possible to internally reconstruct a complex consonant system for Proto-Kartvelian: it included not only those consonant phonemes that are directly reflected as single consonants in the daughter languages (shown in Table 9 of I.2.5 above), but also additional series with accessory features that were subsequently lost when (still within Proto-Kartvelian) the complex phonemes later segmented out into clusters. Specifically, the decessive harmonic clusters can be interpreted as unit phonemes with a phonologically distinctive feature of velarization, which yields a velar or uvular stop or spirant when the phoneme is segmented out. Analo-

23. Decessive harmonic clusters are two-consonant clusters with an initial stop and a following homogeneous velar or postvelar stop or spirant (Axvlediani 1949:107ff.):

<i>bɣ</i>	<i>dɣ</i>
<i>pɣ</i>	<i>tɣ</i>
<i>p'q'</i>	<i>t'q'</i>

24. Another root type in Kartvelian is represented by the few stems with initial *š- or *s-, apparently an ancient prefixal element:

*š-tagw- (Geo. *tagv-i*, Laz *mtug-i*, Svan *šdugw* 'mouse')

*š-taw- (Geo. *tav-i* 'head', Laz *ti* id., Svan *šda* 'head of grain')

*š-txar- (Geo. *txar* 'dig', Svan *čot-štxar* 'dug up')

*s-tw- (Geo. *stvel-i*, Laz *stvel-i* 'grape harvest')

These can be compared to the Indo-European forms with 'prefixal' *š- or *s- (see I.2.4.2 above).

gously, the C+w clusters must be viewed as labialized consonants in early Proto-Kartvelian; they later segmented out into clusters of consonant plus /w/. The evolution of the Proto-Kartvelian labialized consonants can be compared to the analogous evolution of the labialized consonants posited above (I.2.2) for Indo-European.

The complex consonant system posited for Proto-Kartvelian on the basis of internal reconstruction brings Proto-Kartvelian close to the rich consonantism of the Northwest Caucasian (Abkhaz-Adyghe) area.

4.3.3. *Types of root reduplication in Proto-Kartvelian in comparison to Indo-European reduplication*

When the complex consonant phonemes segmented out into clusters in late Proto-Kartvelian, the result was a system of consonants and sonants that closely approximated the late Proto-Indo-European structural type.

There is a small group of Proto-Kartvelian noun bases with reduplication, voicing of the reduplicated initial sibilant, and syllabic [i] in the reduplicated syllable: *zi-s-*, *ži-č'-* (Gamkrelidze and Mačavariani 1965:317):

**zixl-* 'blood': Geo. *sisxl-*, Mingr. *zixsir-*, Laz *dicxir-*, Svan *zixx*²⁵

**ži[n]č'wel-* 'ant': Geo. *žinč'vel-*, Laz *dimč'k'u*, Mingr. *č'kič'k'i'ia*²⁶

**ži[n]č'ar-* / **ži[n]č'r-* 'nettle': Geo. *žinč'ar-*, Laz *dič'k'iž*²⁷

Once we have posited reduplicated stems for Proto-Kartvelian to account for the obvious examples above, we can also view several nominal formations which show violations of rule (1) above (prohibiting two consonants of the same point of articulation in the same root) as reduplications, analogous to those above but with a true vowel after the voiced initial consonant:

**žēxl-* 'fire': Geo. *cecxl-*, Mingr. *dačxir-*, Laz *dačxur-/dačxir-*; root **čex-* / **čx-*, cf. Geo. *cx-el-i* 'hot', Svan *šix* 'coals'; 3sg. *ā-šix* 'ignited', *ā-šx-i* 'ignites',

25. This structural interpretation of Proto-Kartv. **zixl-* 'blood' makes it possible to set up an original root **-sxl-*, which shows formal similarity to PIE **esH-* 'blood'. A typological parallel for reduplication in the word for 'blood' comes from the Salishan language Squamish (Kuipers 1967:105): *s-ca'-cižn*.

26. It is interesting that both the Kartvelian and the Indo-European words for 'ant' are reduplicated; the Indo-European reduplication has been described as 'visual onomatopoeia' above (4.1.3). A typological parallel for reduplication of the word for 'ant' is Squamish *c'a-c'mi'čn* (Kuipers 1967:107).

27. Expressive reduplication in the word for 'nettle' is also found in some Indo-European dialects, which indicates that there is something shared in the ways of expressing this semanteme. The Indo-European root **not-* / **nt-* 'nettle' (Gk. *adikē*, OIcel. *nōtr* 'nettle', OHG *nezzila*, Ger. *Nessel*, OE *nefele*, Engl. *nettle*, etc.) also occurs in reduplicated form in Celt. **ninati-*, Mlr. *nenaid*, MWelsh *dynad*, Bret. *linad* 'nettle' (Lewis and Pedersen 1954:194).

Geo. *si-cx-e* 'heat', Mingr. *čx-e* 'hot'. For the semantics of this reduplication cf. OCS *popelŭ* 'ash' (see 4.1.3 above); also Squamish *jiʔəʔ* < **ʔəʔ*-*ʔəʔ* 'fire' (root *juʔ* 'burn'): Kuipers 1967:107.28

**ʒeʒw-* 'thorn': Geo. *ʒeʒv-i*, Laz *danz-i*

**ʒacxw-* 'linden': Geo. *cacxv-i*, Laz *ducxu*, Svan *zesxra* (Gudava 1964:497ff.)

**ʒaʃw-* 'blackbird': Geo. *ʃaʃv-i*, Mingr. *zeskv-i*, Laz [*m*]*zesk'u*

**ʒač'w-* 'chain': Geo. *ʒač'v-i*, Mingr. *ʒec'k'v-i* (Giginejšvili 1965)

For the same reason, Proto-Kartvelian **daʃtw-* 'bear' (Geo. *datv-i*, Mingr. *tunt-i*, Chan *mtut-i*, Svan *dāʃdw*) can be classed with the reduplicated stems.²⁹ Further evidence that it is reduplicated is the **ʃ* before the **t*; as a rule, *ʃ* appears root-initially as a prefixal element. This reduplication pattern can be compared to Indo-European C__sC- reduplication of a root with initial *s-* (cf. Skt. *tīṣṭhati*, 4.1.3 and note 4 above). Typological parallels for reduplication in the word for 'bear' are Squamish *siʔ-sinʔ* 'grizzly bear' (Kuipers 1967:107), Shuswap *kəknm-elp* 'grizzly bear' (root *knm-*: see Kuipers 1974:208).

A distinct type of reduplication, rather poorly represented in the Kartvelian dialects but archaic in structural type, is full reduplication of the root with ablaut alternations. The root **bar-/br-* 'turn, revolve' (cf. Geo. *br-un-av-s* 'revolves') forms the reduplicated noun stem **bṛ-bar-* 'wheel', with zero grade in the first element and full grade in the second: Geo. *borbal-* 'wheel'. There is an interesting semantic comparison to be made with the Indo-European word for 'wheel', likewise derived by reduplication of **kʰoel-* 'rotate': **kʰoekʰol-o-* (see 4.1.3 above).

This type of reduplication is formally comparable to Indo-European intensive full reduplication. The only difference is in the distribution of ablaut grades: the Kartvelian type has zero grade in the reduplicated morpheme and full grade in the root, while Indo-European has the opposite distribution, possibly due to an accent shift to the first syllable of the reduplicated stem.

Kartvelian reduplication also shares with Indo-European reduplication the

28. The reduplication of the form for 'fire' can be typologically characterized as visual onomatopoeia, which applied to specific semantemes. The Indo-European word for 'fire' (Skt. *agnī-* 'fire; fire god', Lat. *ignis*, Lith. *ugnīs*, Latv. *uguns*, OCS *ognŭ*) can then be viewed as a reduplicated form **ṇ-k'n-i-*, with the regular reflexes of syllabic **ṇ* in the individual languages: Skt. *a-*, Lat. **in-* > *i-*, Balt. **un-* > *u-* (with dissimilative loss of the *-n-*), Slavic **ǵ-* < **ṇ-* (also possibly with dissimilative loss of the nasal and change of the vowel): see Hamp 1970c:77, Szemerényi 1977b:30. This form in turn could go back to a protoform **k'ṇ-k'n-i-*, with full root reduplication and later dissimilative loss of the initial consonant.

29. In these reduplicated stems the non-initial element is a decessive consonant cluster or a cluster with a labial. When these clusters with labials are interpreted as having earlier been monophonemic units — early Proto-Kartvelian labialized consonants — we probably have an explanation for the fact that these roots violate the constraint against two consonants of the same point of articulation occurring in one root. In Proto-Kartvelian, no such cluster could occur twice in one root.

vowels appearing after the reduplicated initial consonant. The only Kartvelian-specific feature is the voicing of the first consonant, which has no analog in Indo-European reduplication.

4.3.4. *The mechanism of morphophonological alternations in Kartvelian; the two ablaut states of extended stems*

Every Proto-Kartvelian morpheme, when it takes word-forming or inflectional elements, appears in one of two ablaut forms that represent paradigmatic allomorphs. The ablaut alternations of vowels in these stems are one of the basic morphophonological features of the Kartvelian word. Depending on the morphophonological environment, the morpheme appears either in a form with a vowel or in a form without a vowel. We speak of full and zero grades of vocalism correspondingly.

Full grade includes normal grade, with a short vowel, and lengthened grade, with a long vowel. In addition to zero grade, there is reduced grade, with *i* vocalism (the result of a shift of normal-grade *e* to *i*). All these ablaut grades are fully analogous to Indo-European grades, except for reduced grade, which is functionally significant in Kartvelian but not in Indo-European.³⁰

The choice of ablaut grades for morphemes, and hence the allomorphic alternations within the (inflectional or derivational) paradigm, depend primarily on the rules of morphotactics. When a root takes a following element in full grade, the root appears in zero, reduced, or lengthened grade depending on the morphophonological type of formation. The ablaut variations in the morpheme string follow a principle of monovocalism whereby only one morpheme in the string, either root or affixal, can have normal grade.

Ablaut forms of the simple (monomorphemic) root are shown below.

Normal grade	Zero grade
* <i>t'ep</i> - 'get warm' (Geo. 1sg. aor. [<i>gan</i>]- <i>v-t'ep</i>)	* <i>t'p</i> - (Geo. 3p. aor. <i>gan-t'p-a</i> ; <i>t'p-il-i</i> 'warm'; Laz 3p. aor. <i>go-t'ub-u</i>)
* <i>dew</i> - 'put' (Geo. 1sg. aor. <i>da-v-dev</i>)	* <i>dw</i> - (Geo. 3p. aor. <i>da-dv-a</i> , Laz 1p. <i>do-b-dv-i</i>)

30. This brings to mind the few instances where **e* shifts to **i* in individual Indo-European forms, e.g. Skt. *simá*- 'oneself' beside *sama*- 'any(one); the same'; Skt. *sīnam* 'provisions' beside PIE **senH*-, Skt. *sanóti* 'obtains', past ppl. *sātá*- (this Sanskrit *i* cannot have come from the *schwa secundum* of Güntert, since that is reflected in Indic as *a*). These forms may be interpretable as relics of another ablaut grade (for *sima*- see Wackernagel and Debrunner 1930:III.578, Kuiper 1946, q.v. also for forms like *síkvān*- 'capable, smart', *śákvān*-, and also *śíras*-, *kiráti* with an *i* of unclear provenience: Kuiper 1947:199, Polomé 1965:29, note 126); see also Mel'ničuk 1979:5ff.

*č'er- 'cut' (Geo. 1sg. aor.
da-v-č'er)

*šwer- 'get dry, tired' (Geo.
1sg. aor. da-v-šver)

*č'r- (Geo. 3p. da-č'r-a, Mingr.
3p. do-č'k'ir-u, Laz do-č'k'or-u)

*šur- (Geo. 3p. da-švr-a, Laz
me-škur-u 'extinguished, went
out', Mingr. go-škir-u 'dried out')

Reduced grade:

*qed- : *qid- 'bring' (Svan 3sg. aor. an-qid)

*pen- : *pin- 'spread' (Geo. 1sg. aor. v-pin-e, Mingr. 3p. go-pin-u)

*žen- : *žin- 'lie, sleep' (Laz 3sg. pres. žan-s, Mingr. žan-u-[n] 'lies',
Geo. 1sg. pres. m-žin-av-s 'I sleep', Laz di-žin-u 'he went to bed')

Lengthened grade:

Ablaut of Ø with *ā:

pres. *-tl-ej 'plane, shave' (Geo. 1sg. v-tl-i) : aor. *-tāl-e (Geo. 1sg.
v-tal-e, Mingr. 1sg. go-v-tol-i)

Ablaut of *e with *ē:

pres. *-ber 'blow, blow up' (Geo. 1sg. v-ber-[av]) : aor. *-bēr-e (Geo.
1sg. v-ber-e, Svan 3sg. [čw]-ad-bēl-e, Mingr. 3sg. du-u-bar-u)

In principle, any Proto-Kartvelian verbal base of the shape C⁰VC⁰- should have had all of these ablaut types, depending on the paradigmatic context. But in the attested Kartvelian languages only a few verbs show more than one of them, and they occur in different languages. In most cases, each individual verb has only one of the possible ablaut shapes, the others evidently having been lost in the formation of the daughter languages.

A separate type of ablaut structure occurs in verbs with derivational suffixes forming what are known as extended roots in two ablaut states:

State I: root morpheme in normal grade, suffixal morpheme in zero grade

State II: suffixal morpheme in normal grade, root in zero grade

Examples:

Stem I (intransitive verbs)

*der-k'- 'bend'

*šer-t'- 'go out, be extinguished'

*k'er-b- 'be collected'

Stem II (transitive verbs)

*dr-ek'- 'bend'

*šr-et'- 'put out, extinguish'

*k'r-eb- 'collect'

Bimorphemic nominal stems also have the same ablaut states:

Stem I	Stem II
* <i>k'wen-r-</i> 'marten'	* <i>ʒm-ar-</i> 'vinegar'
* <i>ʒay-l-</i> 'dog'	* <i>cm-el-</i> 'fat'
* <i>šax-l-</i> 'house'	* <i>km-ar-</i> 'husband'

But whereas the same verb stem can occur in both ablaut states depending on the morphological formation, nominal stems are always fixed in one or the other state and do not alternate. Thus the ablaut structure of the nominal stem differs from that of the verbal stem. The noun stems have frozen in one of their ablaut states and evidently represent the remains of Proto-Kartvelian alternating models, with only one variant preserved for each model.³¹

When a stem of either State I or II takes a suffixal morpheme in full grade, the stem shifts to zero or reduced grade respectively, as dictated by the principle of monovocalism, which precludes the occurrence of more than one full grade in a wordform (cf. the traces of monovocalism in Indo-European):

State I	State II
* <i>der-k'-</i> > * <i>dr-k'-a</i>	* <i>dr-ek'-</i> > * <i>dr-ik'-e</i>
* <i>šer-t'-</i> > * <i>šr-t'-a</i>	* <i>šr-et'-</i> > * <i>šr-it'-e</i>
* <i>k'er-b-</i> > * <i>k'r-b-a</i>	* <i>k'r-eb-</i> > * <i>k'r-ib-e</i>

In comparing the reconstructed Kartvelian ablaut grades with those of Indo-European, one cannot help noticing that the ablaut behavior of the Kartvelian bimorphemic stems and the Indo-European stems with Schwebeablaut are strikingly similar. The Kartvelian ablaut pattern provides a perfect parallel to Benveniste's binomes as they functioned just before the breakup of Proto-Indo-European (see 4.2.2 above).

4.3.5. The sonant systems of Kartvelian and Indo-European. Variability of sonants in Kartvelian and Indo-European. Laryngeals as distinctive elements of the Indo-European phonemic system

The ablaut alternations of Indo-European and Kartvelian coincide right down to the phonological level, precisely because both languages have sonants as a dis-

31. Anttila 1969:177 compares such distribution of ablaut patterns over nominal and verbal stems in Kartvelian to a reconstructed Indo-European situation where nominal bases have both ablaut states and verbal bases have only one. But the analysis given here (4.2.2 above) shows that ablaut alternations are archaic in verb roots as well. Thus the Kartvelian and Indo-European verbal patterns are structurally identical, while the ablaut alternations of nominal bases were lost in late Kartvelian.

tinct class of phonemes which occurred in syllabic and nonsyllabic variants conditioned by the ablaut alternations. The sonant system of Kartvelian, like that of Indo-European, comprised the phonemes /*r *l *m *n *w *j/, each of which could appear in both nonsyllabic [*r *l *m *n *w *j] and syllabic [*ɾ *ɻ *ṃ *ṇ *u *i] forms depending on the position in the word. The syllabic variants occurred in the following environments:

#_ C
C_ C
C_ #

and the nonsyllabic variants in the following environments:

#_ V
V_ C
V_ #
V_ V
VC_ V

The ablaut alternations of normal and zero vocalism caused sonants to alternate between their syllabic and nonsyllabic allophonic forms. This mechanism is exactly analogous to that reconstructed for one stage of Proto-Indo-European (see I.3.2.1 above).

Another similarity between Indo-European and Kartvelian is alternations among the sonant phonemes. In Kartvelian, as partly in Indo-European, these alternations became morphologized and acquired functional significance (Deeters 1958:14ff.; cf. Abaev 1973a):

n ~ r:

**qan-* 'plow' (Geo. *mo-v-qan*
'I plowed', Mingr. *do-b-xon-i*,
Svan *o-qan*)
**zman-* 'seem, appear in a dream'
(Geo. *me-zman-ebis* 'it seems
to me')

**qar-* 'bull' (Geo. *qar-i*, Mingr.
xoʒ-i)

*-*zmar-* 'dream' (Geo. *si-zmar-i*,
Laz *i-zmoʒ-e*)

n ~ l:

**ʒin-* 'sleep' (verb) (Geo.
m-ʒin-av-s 'I sleep', Laz
di-ʒin-u 'he lay down', cf.
Laz *ʒan-s*, Mingr.
ʒan-u[n] 'lies')

**ʒil-* (noun) (Geo. *ʒil-i*, Laz *ʒir-i*)

In these Kartvelian alternations, the verb stem has *-n-* and the noun stem has *-r-* or *-l-*. They are typologically comparable to the Indo-European sonant alternations of Skt. *ukṣán-* 'bull, male' : Lat. *uxor* 'wife'; Lat. *dominus* 'master' : Gk. *dámar* 'wife'; Gk. *húpnos* 'sleep, dream', Skt. *svápnah* 'sleep' : Hitt. *šuppariya-* 'sleep', Gk. *húpar* 'while awake'; etc. (see I.3.2.1 above).

In Indo-European, the laryngeals pattern with the sonants in having both syllabic and nonsyllabic allophones. In Kartvelian, the sonants include only the sonorants proper and the glides; there are no phonemes that are typologically comparable to the Indo-European laryngeals in their place in the sonant system and their interaction with the vowels. The laryngeals align Indo-European with the Semitic languages and some North Caucasian languages, not with Kartvelian.

Our structural and typological comparison of the Proto-Indo-European and Proto-Kartvelian systems leads to the conclusion that the structural similarity between the two increased over time and reached its maximum just before each broke up into separate daughter dialects. Also, Indo-European lost the laryngeals, which had constituted the major phonological distinction between the two languages. Systemic changes in Indo-European and Kartvelian were in the direction of increasing similarity, and they ultimately produced a morphophonemic isomorphy so thoroughgoing as to preclude the possibility of independent typological development and to strongly suggest historical contacts (see Gamkrelidze 1966, 1971:34ff.; also below).

Section Two

The Grammatical Structure of Proto-Indo-European

Chapter Five

Proto-Indo-European as a language of the active type

5.1. Binarism of the Proto-Indo-European grammatical structure. The binary nature of nominal categories

5.1.1. The formation of *-os and *-om genitives in Indo-European and their correlation with the binary classification of nouns into active and inactive

When the earliest system of Indo-European grammatical categories — inflectional and derivational — is studied it becomes obvious that features of binarism penetrate the entire linguistic system, grammatical and lexicosemantic. The binarism appears both in the presence of doublets in the lexicogrammatical system and in binary oppositions on the content plane of Proto-Indo-European.

The nominal declension shows the existence of parallel inflectional markers with particular clarity. The earliest markers of the Indo-European genitive can be reconstructed as a set of doublet forms in both the singular and plural. An ending *-os (*-es) can be reconstructed for Proto-Indo-European on the evidence of forms such as Gk. *podós* (genitive of *poús*, *pós* 'foot'), Skt. *pad-ás* (gen.) 'foot', Lat. *pedis* (genitive of *pēs*), Hitt. *nepiš-aš*, genitive of *nepiš* 'sky', etc. An *-os ending must also be reconstructed for the plural on the evidence of Hittite, where -aš indicates the genitive in both the singular and the plural: Hitt. *ud-dan-aš*, genitive singular and plural of *uddar* 'word' (Friedrich 1960). Thus the ending *-os of Indo-European expressed the grammeme of the genitive case in combination with both the singular grammeme and the plural grammeme.

Together with that ending and parallel to it, a morpheme *-om can also be distinguished in Indo-European. It functioned analogously, as a genitive case formative in both the singular and the plural. Examples showing the genitive singular function: Hitt. *antuḫš-an* (KUB XXIII 77, 51) 'of [a] person', LÚLabarnan 'of King Labarnas' (IBoT I 30, 3); LUGAL-an 'of the king', LÚKÚR-an 'of the enemy', GÌR-an 'of [the] foot' (Friedrich 1960, Laroche 1965a:33-41). Genitive plural: Lat. *ped-um* < **ped-ōm* 'of feet', *dentum* 'of teeth', *hominum* 'of people', *nominum* 'of names',¹ OCS *imenŭ* 'of names',

1. The ending *-om with genitive singular function is also visible in the Latin pronominal forms *nostrum* 'our', *uestrum* 'your', which contrast with the genitives *nostri* 'our', *uestri* 'your' in expressing distributive meaning: *pars nostri* 'our part' but *pars nostrum* 'the part of each of us' (cf. *Minus habeo uirium, quam uestrum uteruis* 'I have less strength than each of you (two)', Cic. Sen. 32: Sobolevskij 1939:§§ 507, 508). This usage of *-om shows that the genitive morpheme was indifferent as to number. For the original non-differentiation of *-om > Lat. -um

materū 'of mothers' (cf. Lat. *matrum*), *nebesū* 'of skies', *synovū* 'of sons', Hitt. *pa-ta-a-na* 'of feet' (*patan-* + *-a* 'and': 114/d I, 19; alternating with *GÌR^{HI}A-na* in the parallel text 256/e I, 5: Friedrich 1952:165), Laroche 1965a:36ff.; Hitt. *ú-it-ta-an-na* 'of years' (*wittan-a*) in *ú-it-ta-an-na ku-ut-ri-eš-mi-it* NU.GÂL 'and the shortness of my years is absent', KUB XXIX 1 Vs. I 22; OHitt. DUMUMEŠ-*an* (Otten and Souček 1969:II 16, 65). In Hittite it is sometimes unclear whether *-an* represents the singular or plural: OHitt. *šūnan antuḫša-* (Telepinus document, 2BoTU 23 A II 32) 'a man of the gods' or 'man of god' (Laroche 1969); OHitt. *[(ka)]-a-ša-ta-aš-ma-aš-kán ut-ni-ya-an-da-an la-a-lu-uš da-a-aḫ-ḫu-un* 'look! I took from you the bad speech of the population' (Otten and Souček 1969, Vs. I 11', 18-19; Otten and Souček read this form as a genitive plural in 65, 126).

In addition to **-om*,² there is also an unambiguously reconstructible **-ōm* with a long *ō* (Gk. *ped-ōn*, Skt. *pad-ām* 'of feet', Lith. *vilkų* 'of wolves'). It can be traced to the same genitive ending **-ōm* plus the plural marker **-s* which appears in other forms (cf. acc. sg. **-om*, acc. pl. **-om-s*, loc. sg. **-i*, pl. **-si*). Long *ō* is due to a final *-s* following a sonant: **-om* + **-s* > **-ōm* (see I.3.1.8 above). A trace of this **-s* may be visible in the Hittite genitive plural ending *-enz-[an]* of pronominal bases: *apenzan* 'of these', *šūmenzan* 'of your', etc. It is possible to see the same ending in the form *nepišanza*, so far without precise interpretation;³ cf. also Luw. *-nzan* as a genitive plural ending (Laroche 1959a:137, § 27) beside the possible ending *-nz-aš*.

The rise of the genitive plural formative **-om-s* and the differentiation of the genitive singular and plural should be considered a relatively late development, dated to the time when separate plural forms arose in Indo-European declension and the genitive singular and genitive plural could come into opposition. The appearance of the genitive plural formative **-om-s* > **-ōm* triggers a redistribution of the genitive case morphemes and a consequent differentiation of genitive markers depending on number:

Original oppositions

Genitive singular/plural
**-os*

Genitive singular/plural
**-om*

The two parallel genitive markers **-os* and **-om*, not differentiated by

in Indo-European, see also Sommer 1914:412, Knobloch 1954-1955:255, 1958:236-39.

2. A reflex of the case form in **-om* has also been noted in **k^{hoet}bur-om* 'four' (gen.); cf. the OCS genitive *četyrŭ* < **k^{hoet}bur-om* in the Marianus Gospel (Mark 13:27, Matthew 24:31, Luke 2:37) and the Zographensis Gospel and the Suprasliensis manuscript: Suprun 1961:50, 1969:122 (with the conclusion that this was the older form).

3. The *z* instead of expected *š* in these Hittite forms is due to voicing of *s* after the sonorant *n*, cf. *daganzipa-* < **dagan-* + *šepa-* 'spirit of earth'.

number, that are reconstructed for the earliest state of the Indo-European nominal paradigm are best reflected in Hittite, where the formatives *-aš* and *-an* are genitive endings for both singular and plural. In Hittite these forms are clearly in opposition, in that *-an* appears only in nominals of common gender. Although examples of forms in *-an* are not numerous in Hittite, there is ample justification for claiming that the *-an* genitive is not typical of neuter nominals, while *-aš* appears on forms of both genders. This distribution clearly reflects an earlier correlation of these formatives with gender: *-an* was associated with the common gender, i.e. with animate nouns, while *-aš* was evidently found only in the neuter gender, i.e. with inanimate nouns. Subsequently, *-aš* extended to animate (common gender) nouns, and this effaced the original grammatical correlation of the two genitive endings. *-an* still preserves its restriction to the common gender as an archaic relic in the written history of Hittite.

The semantics of the Hittite genitive endings must reflect an ancient Proto-Indo-European stage where the morphological doublets **-os* and **-om* were characterized by different semantic functions. To judge from the Old Hittite data, **-os* is to be reconstructed as a genitive formative (both singular and plural) for inanimate nouns, while **-om* was the genitive (both singular and plural) for animate nouns. Thus we can ascribe to the earliest Indo-European stage a strict formal distinction in the expression of morphological categories (specifically, the genitive) based on an animacy opposition in nouns.

In the attested Indo-European dialects there has been a complete redistribution of the original Indo-European genitive endings. The rise of the specifically plural genitive ending **-ōm* < **-om-s* destroyed the symmetry between the original two formatives and resulted in elimination of **-om* as a genitive marker. In systems such as Greek and Sanskrit, **-ōm* becomes a marker of the genitive plural while **-os* is a genitive singular.

The genitive singular marker **-os* obviously coincides formally with the nominative ending **-os* of animate nouns.⁴ An expanded genitive marker **-osyo* (evidently the original ending **-os* plus an enclitic of pronominal origin, cf. Hitt. *-ya-* 'and', Toch. A *yo* 'and' and the IE relative pronoun **yo-* 'which'; for a typological parallel cf. PIE **k^hoe* 'and' and **k^hoi-s* 'which') arose to disambiguate the two endings: Skt. *vṛkasya*, gen. of *vṛkaḥ* 'wolf' (cf. OPers. *kāra-hyā*, gen. of *kāra-* 'army'), Gk. *lúkoio*, gen. of *lúkos* 'wolf', Arm. *gayloy*, gen. of *gayl* 'wolf'.⁵

4. This stage of the Indo-European nominal paradigm is best preserved in Hittite, where the nominative and genitive case forms do not differ in their segmental phonemes: cf. nom. *attaš* 'father', gen. *attaš*; nom. *annaš* 'mother', gen. *annaš*, etc.

5. Knobloch 1965:155-56 suggests the possibility of interpreting PIE **w^lk^hoos-yo* *wōk^hos* 'wolf speech' as analogous to Kabardian *ade-m ji hune*, i.e. as a sequence of modifying noun + case marker + possessive marker + modified noun; and he connects the **-yo* of this construction with the possessive *-yo* of Balto-Slavic **mo-yo*, **two-yo*, **swo-yo* and with an older function of **yo* as a linking syntactic element. This function explains its later use

A major factor in the redistribution of the original genitive markers was the destruction of the binary animate/inanimate system of Indo-European noun classes and the switch of nouns from one class to the other. This led to the varied formation of genitives observed in the daughter dialects, where the form of the genitive depends on the structural type of the noun stem. As a consequence of this redistribution, the genitive markers originally associated with nominal gender classification are redistributed over various nominal declension classes in the individual dialects. The correlation with gender classes was lost, and the formatives became purely paradigmatic elements with various distributions depending on the structural type of the noun declension.

5.1.2. The nominative *-os and accusative *-om as original markers of active and inactive noun classes

The original genitive endings *-os and *-om coincide formally with the nominative *-os and accusative *-om. The coincidence is not only formal but also functional to some extent, since we can reconstruct for Proto-Indo-European a specific correlation of the nominative and accusative case formatives with noun gender classification. In traditional reconstructions, the nominative singular case form has the markers *-s and *-os, where *-os is considered a thematic formation in -o with ending -s. Examples of PIE *-s:

*t'enth-s 'tooth': Lat. *dēns*, Gk. *odōn*, *odoús*, Skt. *dán*.

*phet'-s 'foot': Lat. *pēs*, Gk. *poús* (*pós*), Skt. *pāt*.

*sonth-s 'being; true': Lat. -*sēns* (in *ab-sēns*, *prae-sēns*), Gk. *eón*, Skt. *sán*,

Hitt. *ašanza*.

*bhāgh-u-s 'hand': Skt. *bāhúh*, Gk. *pēkhús*.

*Howi-s 'sheep': Skt. *ávi*-, Lat. *ouis*, Gk. *ówis*.

*Hner-s 'husband': Skt. *nā*, Gk. *anēr*, Arm. *ayr*.

*t'oH-ther-s 'giver': Skt. *dātā*, Gk. *dōtōr*.

*swesor-s 'sister': Skt. *svásar*-, Lat. *soror*.

*ghyem-s 'winter': Lat. *hiems*, Gk. *khiōn*.

*khwon-s 'dog': Gk. *kúōn*, Skt. *śuvā*, Lith. *šuō*.

*k'oenaH-s 'wife': Gk. *gunē*, Goth. *qinō*, OCS *žena*.

Examples of PIE *-os:

*wļkho-os 'wolf': Skt. *vṛkaḥ*, Gk. *lúkos*, Lat. *lupus*, Lith. *vilkas*, OCS *vlikŭ*, Goth. *wulfs*.

*ekhw-os 'horse': Skt. *ásvaḥ*, Gk. *híppos*, Lat. *equus*.

*t'eiw-os 'god': Skt. *deváh*, Avest. *daēva*- 'demon', Lat. *dīuus*, Olcel. *Týr* 'war god', Lith. *diēvas* 'god'.

Accusatives of nouns with **-s* and **-os* nominatives are formed by replacing the nominative endings with **-m* and **-om* respectively:

Nom. **t'enth-s*, acc. **t'enth-m*: Lat. *dentem*, Gk. *odónta*, Skt. *dántam*.

Nom. **phet'-s*, acc. **phet'-m*: Lat. *pedem*, Gk. *póda*, Skt. *pádam*.

Nom. **sonth-s*, acc. **sonth-m*: Lat. *-sentem*, Gk. *eónta*, Skt. *sántam*.

Nom. **bhāḡhu-s*, acc. **bhāḡhu-m*: Skt. *bāhúm*, Gk. *pēkhun*.

Nom. **Howi-s*, acc. **Howi-m*: Skt. *ávim*, Lat. *ouim*, Gk. *ówin*.

Nom. **Hner-s*, acc. **Hner-m*: Gk. *anáera*.

Nom. **t'oHther-s*, acc. **t'oHther-m*: Skt. *dātāram*, Gk. *dōtēra*, Lat. *datore*.

Nom. **swesor-s*, acc. **swesor-m*: Skt. *svásāram*.

Nom. **ḡhyem-s*, acc. **ḡhyem-m*: Gk. *khíóna*, Lat. *hiemem*.

Nom. **k̑hwon-s*, acc. **k̑hwon-m*: Skt. *śvánam*, Gk. *kúna*.

Nom. **k'oenaH-s*, acc. **k'oenaH-m*: OCS *ženq*.

Nom. **włkho-os*, acc. **włkho-om*: Skt. *vṛkam*, Gk. *lúkon*, Lat. *lupum*, Lith. *vilka*, OCS *vlíkū*.

Nom. **ek̑hw-os*, acc. **ek̑hw-om*: Skt. *áśvam*, Gk. *híppon*, Lat. *equum*.

Nom. **t'eiw-os*, acc. **t'eiw-om*: Skt. *devám*, Avest. *daēvəm*, Lat. *dīuum*, Lith. *diēvq*.

The accusative ending **-om* coincides formally with the nominative **-om* in the neuter gender:

PIE nom.-acc. **yuk'-om* 'yoke': Skt. *yugám*, Gk. *zugón*, Lat. *iugum*, Hitt. *iukan*, OCS *igo*.

Nom.-acc. **phet'-om* 'track, soil, place': Skt. *pádám*, Gk. *pédon*, Hitt. *pedan*.

Nom.-acc. **t'erw-om* 'wood': Goth. *triu*, OE *teoru*, OCS *drěvo* (the original Indo-European meaning was 'arboreum', 'id, quod ex arbore nascitur': Lohmann 1932:13).

Nom.-acc. **ai-w-om* 'lifespan': Lat. *aeuum* 'eternity, years'.

Nom.-acc. **phthēr-om* 'wing': Gk. *pterón*, cf. Skt. *pátram* 'wing'.

Nom.-acc. **westhr-om* 'clothing': Skt. *vástram*.

This formal coincidence of endings cannot be accidental and must point to some functional connection between these categories. Now, all the neuters in **-om* share the semantic feature of inanimacy (cf. the meanings of the forms given above: 'yoke', 'soil', 'clothing', etc.). In this respect they differ sharply from the nouns with **-s* or **-os* (cf. the meanings 'husband', 'man', 'sister', 'wolf', etc.).

The semantic opposition of these two classes of nouns is quite clear: one may state with confidence that the endings **-s* and **-os* form nouns belonging to the animate class (including nouns referring to objects conceived of as animate), while those in **-om* designate objects belonging to the inanimate class (cf. also Shields 1978). The animate class can be viewed as an active class, i.e. one

referring to objects capable of acting (or conceived of as capable of acting), while the inanimate class comprises nouns referring to objects incapable of acting. This classification of nouns can be described as based on the activity or inactivity of their referents (denotata). Then the Indo-European nominal formations in **-s*, **-os*, and **-om* can be regarded as derivational, bearing suffixes marking them as belonging to one of two binary classes, active or inactive. **-s*, **-os* is the derivational marker of the active class, **-om* the marker of the inactive class.

5.1.3. The markers of inactive nouns and the basic semantic principles of the binary noun classification into active and inactive

Other markers of the inactive class are the suffixes **-t*, **-th*, and **-kh* discussed in I.3.1.9 above, as in **wot'or-th* 'water' (Gk. *húdōr*, gen. *húdatos*, Hitt. *watar*), **yekhoṛ-th* 'liver' (Skt. *yákṛt*, gen. *yaknāḥ*, Gk. *hēpar*, gen. *hēpatos*), **kher-t* 'heart' (Lat. *cor*, gen. *cordis*, Hitt. *kir*, *kardiya-*). Another marker of the inactive class was zero.

It is clear that a basic structural-semantic principle of early Indo-European was a binary classification of nouns into active and inactive based on the character of their denotata. The active class included nominal formations referring to people, animals, trees, and plants, i.e. those whose denotata are alive, while the inactive class referred to objects lacking life cycles (for this typology see Klimov 1973:216ff.). Thus nouns referring to trees in Indo-European belong to the active class (cf. Lat. *pirus* 'pear tree', *mālus* 'apple tree', Russ. *jablonja* 'apple tree'), while the fruits of the same trees were thought of as inactive objects and assigned to the inactive noun class (cf. Lat. *pirum* 'pear', *mālum* 'apple', Russ. *jabloko* 'apple'): cf. Meillet 1948:I.211-29.

In addition to nouns with naturally active denotata, the active class also must have included those inanimate objects which were viewed by speakers of the language as expressing the active principle or endowed with the capacity for action. Such nouns include human body parts which are mobile or capable of action, such as *hand*, *foot*, *eye*, *tooth*; and also the names of natural phenomena and abstract conceptions which were personified and viewed as active: *wind*, *thunder*, *lightning*, *autumn*, *water*, *river*; *fate*, *lot*, *portion*, *good*, etc.

Interestingly, there are lexical doublets referring to such notions, where the paired words belong to different noun classes: PIE **Haph-* 'water, river' (Skt. *āpah* 'waters' (pl.), cf. *apām- nāpāt* 'grandson of the waters', Avest. *āfš* 'stream', Hitt. *ḥap-* 'stream', Latv. *upe*) beside **wot'orth* 'water' (Hitt. *watar* 'water', Gk. *húdōr*, gen. *húdatos*, OE *wæter*) (see Laroche 1973); PIE **ḡk'ni-* 'fire' (Skt. *Agní-* 'fire; fire god', Lat. *ignis* 'fire, heavenly body, lightning', OCS *ognǔ*, Latv. *uguns* 'fire') beside **phHhur-* 'fire' (Hitt. *pahḫur* 'fire', Toch. A

por, B *puwar*, Goth. *fōn*, Gk. *pūr* 'fire', Arm. *hur* 'fire', *hn-oc* 'hearth', Czech *pýří* 'burning coal, firebrand'). The first member of each pair had active meaning and belonged to the active class (water as a moving, active element, 'stream'; fire as an active, deified element or force), and the second referred to the same denotatum as a non-living element and belonged to the inactive class. (Cf. Slavic, where *ognĭ*, Russ. *ogon'* 'fire' can refer to a personified element, e.g. *Tsar'-Ogon'* 'King Fire' in East Slavic fairy tales; while forms based on *pyr-* refer only to the process of burning: Mastrelli 1958:7.) The active class also included the names of heavenly bodies: 'sun', 'moon', 'star'.

The division of nouns into active and inactive reconstructed for Indo-European finds frequent typological parallels in many languages with binary noun classification (see Klimov 1973:213ff.). The binary classification motivates all of the basic structural grammatical and syntactico-semantic features of early Proto-Indo-European that can be established by comparative and internal reconstruction based on the Indo-European languages. It accounts for many features of Indo-European, pertaining to both grammar and syntactic and semantic relations.

Assuming a binary opposition of active and inactive noun classes entails dividing the verbal lexicon into two basic classes corresponding to the noun classes: verb forms combining with active nouns and those combining with inactive nouns. This in turn leads to a natural division of the verbs into two semantic classes: verbs with active semantics (*go, chase/run, destroy/perish, eat, live, breathe, talk, laugh, kill, grow*, etc. — verbs expressing actions or states typical only of active denotata) and verbs with inactive semantics (expressing actions or states typical of inactive denotata). From a strictly logical viewpoint, the class of verbal semantemes that can combine only with inactive nouns is extremely restricted, and each such verb has a counterpart that can combine with active nouns: *lie, fall, be heavy, be small, be large*. In such cases the formal opposition of active to inactive is expressed by parallel grammatical markers in the nominal or verbal paradigm, and by lexical doublet forms of nouns and verbs.

5.1.4. *The class of semantically inactive nouns and the structural-syntactic inactive. The origin of the Indo-European accusative case*

For the earliest stages in the development of the Indo-European nominal system we can posit a binary nominal classification into active and inactive based on the semantics of the referents. The derivational markers of the classes were **-s* or **-os* for actives and **-om*, **-t'*, **-th*, **-kh*, and *-Ø* for inactives. Correspondingly, an active argument of a verb form took a suffix **-s* or **-os*, and an

inactive argument took **-om*, **-t'*, **-th*, **-kh*, or **-Ø*.⁶

Depending on whether active or inactive word-forming suffixes were added, one and the same root could form nouns of both classes:

PIE **phet'-s* 'foot', active (Skt. *pát*, Lat. *pēs*, Gk. *poús*) and **phet'-om* 'track', inactive (Gk. *pédon*, Skt. *padám*, Hitt. *pedan*).

PIE **yuk'-s* 'bound, tied', active (Lat. *coni(u)x*, gen. *coniugis* 'spouse') and **yuk'-om* 'yoke' (Lat. *iugum*, Skt. *yugám*, Hitt. *iukan*).

PIE **Hner-s* 'husband', active (Gk. *anēr*, Skt. *nā*, Arm. *ayr*) and **Hner-th*.

These derivations must be distinguished from properly active nouns which took the inactive ending, **-m* or **-om* depending on whether the original form was in **-s* or **-os* respectively.⁷ This **-m* / **-om* (unlike the semantic marker **-om*) appears on an active noun which functions as an argument of a verb that has another argument in **-os* or **-s*. In other words, a two-place verb of active semantics takes one argument with the active ending while the other necessarily has the inactive marker.

For example, lexemes with meanings like 'person' and 'animal' belonged semantically to the active class and took the marker **-s*/**-os*. But in a sentence '(the) person killed (the) animal' with the two-place verb 'kill', only one argument — the one expressing the semantic agent — could represent the active class in **-s*, while the other, the semantic patient, was thought of as inactive and took the inactive marker. This inactive form can be interpreted as a *structural-syntactic inactive*, in contrast to the basic, lexically assigned inactives with their fixed inactive markers. The structural-syntactic use of the inactive can be seen as the germ of a case system; specifically, it represents an accusative, opposed to a nominative in **-s*/**-os*. This explains the fact, long noted in comparative Indo-European grammar, that the accusative case is formally identical to the nomina-

6. Several of these suffixes used as derivational markers of membership in the active or inactive class can be traced to pronominal bases. Clearly of pronominal origin is the active marker **-o/s* (cf. the Indo-European pronoun **so*: Skt. *sá*, Avest. *ha-*, Gk. *ho*, Goth. *sa* 'this'), as is the inactive marker **-t* (cf. the Indo-European pronominal stems Skt. *ta-*, Avest. *ta-*, Gk. *tó*, Goth. *þa-*, OCS *tŭ, to*). The pronominal origin of markers with such functions can be illustrated by data from many languages: cf. Schuchardt 1950a:105 et pass., 1950b:252 ("the active case can also have a suffix or pronoun attached to it"). J. Schmidt 1889:190 identified the *-t* of Skt. *yákr-t*, *śákr-t* with the *-t* in neuter pronominals such as **tho-th* > Skt. *tát*, **yo-th* > Skt. *yád*. Kuryłowicz 1964:211 later compared this to the parallel occurrence of *-s* in the nominative singular of nouns and in (non-neuter) pronouns; cf. the striking (and apparently purely typological) parallel in (late Anatolian) Lydian, where all neuter nouns have the marker *-d* (evidently from pronominal **-t*) and all non-neuters have *-s*.

7. The formal distinction of active **-s* vs. **-os*, reconstructed for the earliest Indo-European protoforms, may reflect some additional semantic subdivision within the active nouns, one whose basis can no longer be consistently defined. The two forms must therefore now be regarded as completely parallel, although each motivates the further, dependent, members of its paradigm. The two appear in one paradigm with different functions (nominative and genitive) and different stress placement (Gk. *poús* 'foot' < **phot'-s*, gen. *podós*, Skt. *pát*, gen. *padáh*: for this accentual type see Kiparsky 1973:799, 806); but this must be regarded as a later development.

tive-accusative case of neuters.

Thus for the earliest stages of the Indo-European nominal system we can reconstruct a binary classification of nouns as active and inactive, with later formation of an active case ending **-s/*-os* and an inactive ending **-m/*-om, -Ø*. The inactive case marked the inactive argument with one-place verbs as well as with two-place and possibly three-place ('give', 'name', etc.) verbs:

$$\begin{cases} \text{Active (A): } *-s/*-os \\ \text{Inactive (In): } *-om, -\emptyset \\ \text{Structural-syntactic inactive (AIn): } *-m/*-om \end{cases}$$

5.1.5. Attributive constructions in **-os* and **-om*. The origin of the genitive case in Indo-European

The endings **-os* and **-om* were not only markers of the active and inactive noun classes; the nature of their functions enabled them to mark attributive syntactic constructions that later gave rise to possessive constructions. Where the modifying noun (the possessor) in such a syntagma belonged to the active class, the syntagma was marked with **-os* regardless of the class of the head (possessed) noun; and when the determiner was inactive, the syntagma was marked with **-om* regardless of the class membership of the head word (A = noun of active class, In = noun of inactive class; modifier [possessor] precedes modified [head] noun):

- (1) A — A-[o]s
- (2) A — In-[o]s
- (3) In — In-[o]m
- (4) In — A-[o]m

Construction types (1) and (3) give rise to appositive forms that yield compounds such as Skt. *rāja-putra-* 'son of king', *mānuṣa-rākṣasa-* 'man-demon', i.e. 'demon in human form', Gk. *iatró-mantis* 'doctor-soothsayer', Ger. *Werwolf* 'werewolf', 'man-wolf' (Thumb and Hauschild 1959:II, § 661, 401).

On the other hand, construction types (2) and (4), where inactive nouns had the ending **-os* and active nouns had **-om*, provide the source for a separate case form which subsequently developed (in Indo-European proper) into a distinct genitive, both determining and possessive.⁸ As dictated by the

8. Before the possessive genitive arose, possessive relations were presumably expressed by constructions of the type 'man his-son' = 'the man's son', cf. OHitt. SAG.GEME.1RMES *e-eš-ḫar-še-mi-it* (BoTU 9 I 9) 'servants their-blood', cf. analogous constructions in Sumerian: *é*

modifying word in the construction, the ending **-os*, identical to the active class marker **-os*,⁹ becomes the genitive marker of the inactive class, while the ending **-om*, identical to the inactive class marker **-om* and the structural-syntactic inactive with two-place predicates, becomes the genitive marker for active nouns. This is how the endings **-os* and **-om* became genitive markers with both attributive and possessive functions, on respectively inactive and active nouns.¹⁰ This account of the origin and development of the **-om* genitive explains its formal identity to the ending **-om* which marked the structural-syntactic inactive and subsequently developed into the accusative case.

This type of syntactic relation, expressed by the formal coincidence of genitive and accusative, is also found in certain later transformations of Indo-European structures. The syncretism of the genitive and accusative cases in Slavic animate nouns, frequently noted in comparative Indo-European grammar, is to be explained in the same way. Specifically, *o*-stem nouns belonging to the class of animate beings began to show genitive-accusative syncretism with generalization of genitival *-a* even in Common Slavic; the same formal coincidence is found in the tonic forms of first- and second-person pronouns and in the interrogative pronouns (*mene, tebe; kogo* from *kūto*): Meillet 1951:349, 355; Kuznecov 1953: § 33, 117.¹¹

5.1.6. *The rise of adjectival formations from determining constructions in Indo-European; the originally binary structure of gender formations*

Constructions (1)-(4) above, later the source of the genitive as a discrete case element in the nominal inflection, also gave rise to a separate syntactic class of *melam-bi* 'temple its-brilliance' = 'the brilliance of the temple', *é-e lugal-bi* 'this temple its-king'. A possessive genitive case in *-a(k)* appears later in Sumerian: *lugal é-ak* 'the king of the house' (see Rifftin 1946a:42, Diakonoff 1967:83).

9. The syncretism of nominative and genitive markers is especially clear in the Old Hittite ending *-aš*, which expresses both the nominative singular of the thematic declension in *-a* and the genitive in the same declension; this must reflect ancient Indo-European relations between active nouns and the attributive syntagmas in **-os* which developed into genitive constructions. The accent shift in the genitive case reflected in Greek and Sanskrit, e.g. Gk. *skōr* (nom.-acc. sg. neut.) < **skōorth-* 'dung', gen. *skatōs*, Skt. *śákṛt* 'feces', *śaknás* (cf. Hitt. *zakkar, zakkanaš*), is secondary on this view: nouns of this type did not originally take the ending **-os* (this pattern is restricted to isolated neuter nouns: see Kiparsky 1973:803, 819).

10. The distribution of **-os* and **-om* genitive endings where **-om* was used on active nouns is still clearly preserved in Old Hittite, where *-an* is used only on neuter nominals (see 5.1.2 above). The principle given here explains the use of *-aš* on neuter nouns in attributive genitive constructions, as in *na-aš huišwannaš* 'and he is living', 'and he is of life', *na-aš harkannaš* 'and he perishes', 'and he is of ruin', *na-aš tayazilaš* 'and he is of thievery' = 'and he is a thief' (Hittite Laws, § 73, KUB XIII 9 II 8).

11. A typological parallel for the uniform marking of the genitive and accusative functions can be found in Semitic plurals, where the case in *-ī* is a single undifferentiated oblique case, opposed to the Semitic (Proto-Akkadian) direct case in *-ū* (Gelb 1969:72-73).

nominal formations which subsequently acquired the formal status of adjectives. These were modifying nouns which took the ending **-[o]s* or **-[o]m* depending on the animacy and hence activity of the modified word. Thus the later adjectival endings **-[o]s* and **-[o]m* reflect the functions that these endings had in the original constructions. This explains why the adjective endings coincide with case formatives in Indo-European noun declension.

Adjectival forms with **-[o]s* and **-[o]m* were used in attributive constructions where the modified noun was active (in **-[o]s*) or inactive (**-[o]m*) respectively. Thus at this stage of development the adjectival formations constituted agreement categories marking the syntactic connection of the noun to the modifying adjective. This is reflected in a general sense in Hittite, which has a binary classification of nouns traditionally known as common (i.e. animate) and neuter (inanimate) gender. There are agreeing adjectival endings for common gender, *-[a]š*, and neuter, *-an/-Ø*: *newaš* 'new' (common), *newan* (neuter); *aššuš* 'good' (common), *aššu* (neuter); *šalliš* 'large' (common), *šalli* (neuter), etc. (see Risch 1980:263). This same early Indo-European stage is reflected in the adjectives of a number of Indo-European dialects which have a single form for masculine and feminine gender and a distinct form for neuter: cf. Latin adjectives such as *fortis* 'strong' (masc., fem.), *forte* (neut.), Skt. *tanú-ḥ* 'thin' (masc., fem.), *tanú* (neut.) (Meillet 1931c).

The original binary division of adjectives into **-os* and **-om* can be traced especially clearly in Greek, where adjectives in **-os* became associated with masculine or feminine and adjectives in **-om* with neuter: cf. Gk. *pátrios* 'father's, pertaining to father' (masc., fem.), *pátrion* (neut.); cf. also in Hesiod *hierós* 'sacred' (masc., fem.), *hierón* (neut.); Hom. *klutòs Amphi-trítē* (Odyssey 5.422), *klutòs Hippodámeia* (Iliad 2.742), *brotós esti* (Odyssey 5.218) '[she] is mortal' (of Penelope); etc. Cf. also the absence of gender inflection in compound adjectives: Hom. *rhododáktulos* 'rosy-fingered' (of Eos, Dawn), *leukólenos* 'white-elbowed' (of Hera), etc.; cf. also Myc. *a-na-mo-to* (= **anármosto*) *i-qi-ja* 'unharnessed chariot'; for such forms in Ancient Greek see Kastner 1967.

The binary opposition of adjectival formations in the Indo-European dialects clearly reflects the binary classification of nouns into active and inactive which was transformed into a gender classification in the historical dialects. Hittite, with its two genders, common (animate) and neuter (inanimate), is closest to the original system. The common (animate) gender subsequently split into masculine and feminine in a number of ancient Indo-European dialects: Sanskrit, Greek, Latin, and others.¹²

12. The claim (Pedersen 1938, Kammenhuber 1961a) that Hittite adjectival forms in *-i*, e.g. *parkui* 'clean', are evidence of a feminine gender is not convincing: the *-i* in these forms is not a marker of feminine gender in adjectives, corresponding to the long *-ī* of Sanskrit (cf. Skt. *svādú* 'sweet', fem. *svādvī*), but belongs to the stem and may be derivational in origin; it is synchronically unsegmentable (cf. the meanings of *parku-* 'high' but *parkui-* 'clean'): see

The common (animate) gender reflects the old active class. When it later split into masculine and feminine genders, that opposition was purely grammatical and not strictly based on whether the referent was male or female. Before that split, the element **-sor* (in origin an independent word meaning 'woman': Skt. *strī*) had to be affixed to a noun stem to indicate that it referred to a female. Nouns referring to males were unmarked. (For the formation of the feminine gender in Indo-European see also Brosman 1982.)

Examples of such formations are Proto-Indo-European words such as **swe-sor-* 'sister' (Skt. *svásar-*, Lat. *soror*, OCS *sestra*, Lith. *sesuō*); cf. also Hittite forms such as *ḫaššuššara-* 'queen' beside *ḫaššu-* 'king', *išḫaššara-* 'lady' beside *išḫaš* 'lord', Luw. *nanašri-* 'sister' beside *nani-* 'brother', Skt. *ap-sarā-* 'nymph' (cf. *ap-* 'water': O. N. Trubačev, p.c.), *tisráh* 'three' (fem. of *tráyah*, cf. Avest. *tišrō*, OIr. *téoir*, Welsh *tair*), *cátasrah* 'four' (fem. of *catvārah*, Avest. *čatagrō*, OIr. *cethéoir*); Lat. *uxor* 'wife' < **ukh-sor-*, cf. Skt. *ukṣán-* 'breeding bull', where **-son-*, formed by the *-r/-n* alternation, is opposed to **-sor* in having masculine meaning (Pisani 1951).

5.2. The origin of the Indo-European nominal paradigm

5.2.1. The rise of the plural forms in Indo-European. Collectives in **-aH* of the old inactive class

The earliest reconstructed system of Indo-European nominal paradigms, with the markers **-os* and **-om* for active and inactive classes respectively, shows a conspicuous absence of any plural markers. Those markers arose later, when the nominal inflection system was fully formed and had separate genitive and accusative cases: **-om* marked the genitive, both singular and plural (subsequently, the two were differentiated into singular **-om* and plural **-om-s*). Similarly, the case of the structural inactive in **-om* was extended with the same **-s* to express the plural.

Plurality in the basic form of the active nominals in **-s/*-os* was expressed by a simple ablaut transformation of the ending to **-es*. This, incidentally, shows that the plural formative is secondary in these forms.¹³ In all such para-

Laroche 1970, Brosman 1976.

13. Since a dual number typologically implies a plural and not vice versa (Greenberg 1963:74), the rise of a separate dual number in Indo-European must have occurred after the appearance of the plural category in the system. The semantic grounds for a distinct dual would have been binary oppositions in the conception of the external world, and also realia such as paired organs. The earliest dual forms of nominals must have been derivational forms (Cuny 1924) going back to compounds with the numeral **t'w-* 'two' (cf. Sanskrit duals in *-u*: *ásmanau* 'two stones', *devyāu* 'two goddesses', *devāu* 'two gods', *vṛkṣau* 'two wolves': Thumb and Hauschild 1959:II, § 245, 34). Typological parallels with dual forms and/or names of paired organs involving a postposed or preposed numeral 'two' come from Northwest Caucasian

digs the plural is formally expressed by a separate marker **-s* when the ending is **-m-* (in the genitive and structural inactive cases) and by morphophonological alternations when the ending has **-s* (in the active case):

	Singular	Plural
Active	<i>*-s</i> / <i>*-os</i>	<i>*-es</i>
Genitive	<i>*-om</i>	<i>*-om-s</i>
Structural inactive	<i>*-[o]m</i>	<i>*-[o]m-s</i>

The inactive nouns in **-om*, **-t'*, **-th*, **-kh*, **-Ø* show a completely different picture. Throughout their entire history the nouns of this class show no trace of special plural forms. The category of plurality is obviously foreign to the semantics of the inactive nominal class. This is evident in the fact that the neuter gender, which essentially reflects the old inactive class, lacks a separate plural form: its only plural form is a collective which takes singular agreement in the verb (J. Schmidt 1889, Tronskij 1946).¹⁴ The collective plurals of the original inactive class are formed with a marker **-ā* < **-aH*:

PIE **t'ér-w-aH*: Slavic **drŭva*, Russ. *drova* 'logs, firewood' (sg. **t'érw-om*: Goth. *triu* 'tree').

PIE **akho-aH*: Lat. *aqua* 'water', OE *ēa*, *ēagor* 'water, stream', Goth. *ahva* 'river'.¹⁵

PIE **bhrāth-r-aH*: Gk. *phrētrē* 'phratry' (cf. the inactive in **-om*: Skt. *bhrātrām* 'brotherhood').

In attributive constructions with adjectival formations, the form of the attributive word was determined by formal agreement with the ending of the modified word; i.e. adjectives take **-os*, **-om/-Ø* and **-es*, **-aH* > **-ā* depending on the class, case, and number of the modified word.

The inactive collective in **-aH* > **-ā* subsequently fell in with active nominal

(Kabard. *la-q'oa* 'foot', 'feet', *bža-q'oa* 'horn', 'horns', Abkhaz *a-t'o-ſoa* 'horns' beside *ſo-ba* 'two', Burushaski (*lt-ur* 'horn', *lt-umal* 'ear', *lt-anc* 'foot' beside *ālti* 'two': Klimov and Edel'man 1974:160), and Eastern Austronesian, specifically Melanesian (Arag: Idu. incl. *gida-ru* 'we two', Idu. excl. *kama-ru*, 2du. *kimi-ru*; Dobu: *si-te-rua*, Capell 1971:335, with postposed **drusa* or **Djewsā* 'two'; Fijian *rua*, see Schuhmacher 1972:204-5; Anudha: *ro-gita* 'we two', *mo-ro-gami* 'we two without him', *mu-ru-gamu* 'you two', etc., with postposed 'two' as in Burushaski). Burushaski has *ālti* 'two' and *w-ālti* 'four'; there is an interesting parallelism between this base-four count of Burushaski (Hamp 1969:340) and that of Indo-European (Loewe 1936): PIE **okʷtʰōu* > Skt. *aṣṭáu*, Goth. *ahtau* 'eight': see Erhart 1965.

14. In Tronskij's formulation, "the single category of plurality found in the historical Indo-European languages was preceded by a linguistic situation where true plurality was found only with active nouns, while the passive class had only the category of collectivity; in nouns of this latter class plurality appeared only later, and evidently together with the shift to the accusative type, where the old opposition of active and passive classes was eliminated" (Tronskij 1946:61).

15. **akho-aH* can be assumed to have been inactive since it has an opposed form **Hapʰ-s* with active semantics: Hitt. *ḫap-* 'water, stream, river', Toch. B *āp* 'water, river', Avest. *āf-š* 'stream, river', Skt. *āpah* 'the Waters'.

formations in **-aH-s* > **-ā*.¹⁶ A form **k'oenaH-s* > **k'oenā* 'wife'¹⁷ (active class) was no longer formally distinct from **akhoah* > **akhoā* 'waters' (inactive). When the original nominal classification was restructured in the daughter languages to a gender-based system with masculine and feminine genders from the old actives, some of the etymologically collective inactive forms in **-ā* began to be reanalyzed as **-ā* forms from the original active class. This was facilitated by agreement of a verb in the singular with collective forms. Thus an Indo-European form like Lat. *aqua*, originally a collective plural inactive, turns into a feminine singular. Many feminine singulars in **-ā* may go back to collective inactives in **-aH*.

It is often difficult to distinguish a collective neuter plural from a feminine singular, e.g. Skt. *tānā*, which can be both a neuter plural ('descendants', lit. 'posterities', RV IX, 62, 2, from *tānam* 'posterity') and a feminine singular ('descendant, offspring': RV III, 25, 1): see Lehmann 1958a:190.

The **-ā* ending naturally occurred on adjectivals which modified nouns in **-ā* (originally this was the ending of a special group of active nouns, most of which later became feminines). The later substantivization of such adjectives in various Indo-European dialects led to the formation of a new type of feminine nominal derivative in *-ā*, such as Lat. *uidua* 'widow' (beside *uiduus*), *noxia* 'mistake' (beside *noxius* 'harmful, noxious'), Gk. *tomē* 'slice, fragment' (beside *tomós* 'cutting, sharp'), *pinutē* 'reason, mind' (beside *pinutós* 'reasonable, wise': see Kuryłowicz 1964:212-13).

5.2.2. *Collectives in *-iH of the old inactive class and the development of the genitive in *-ī*

In some late Indo-European dialects, in addition to the feminine ending *-ā* there is also an ending *-ī* in nominal and adjectival formations: cf. Skt. *vṛkī-* 'she-wolf' (cf. OIcel. *ylgr* < **włkʰo-is*) beside *vṛkaḥ* 'wolf'; *rājñī* 'queen' beside *rājan-* (*n*-stem) 'king'; *devī* 'goddess' beside *deváh* 'god', *balinī* 'strong' (fem.) beside masc. *balín-*, *pr̥thivī* 'earth' (lit. 'wide' [fem.]) beside *pr̥thúḥ* 'wide' (masc.). In other dialects the etymologically identical **-ī* forms a genitive, cf. Lat. *lupī* 'wolf' (gen.) (cf. Skt. *vṛkī-* 'she-wolf') beside nom. *lupus* (cf. Skt. *vṛkaḥ*), *cerebrī* 'head' (gen.) beside nom. *cerebrum*, cf. Skt. *śīrṣán-* 'head'.

The possessive function of this genitive, attested in Celtic and Italic, can be understood if we posit an original meaning 'belonging to, pertaining to'. This

16. For the phonetic shift of **-aH-s* to **-ā* see I.3.1.8 above.

17. According to Knobloch (1955:213, 1958:240), there is evidence for a former collective meaning of Gk. *gunē* < **gw(e)nā* (< **k'oenaH-*) in the 'singulative' formations such as *gunaikós* (with a suffix **-k-* of the same type as in Avest. *pasuka-* 'domestic animal', cf. *pasu-* 'livestock').

meaning can still be established on the evidence of data from the historical Indo-European dialects. It can be seen in Skt. *rathī́-* 'charioteer' (originally 'pertaining to a chariot') beside *rátha-* 'chariot', *grāmī-* 'belonging to the village' (in the compound *grāmī-bhū-* 'become the owner of a village', *grāma-* 'village'). Another example of this structural type is Slavic **sqdī*, OCS *sqdi* 'judge' (beside *sqdŭ* 'court'), identical to Celtic **kondi*, OIr. *cuind* (beside *cond* 'iudicium': Lohmann 1932:70). This usage of **-ī* < **-iH* reflects its earliest function as a word-forming suffix which marked a relation of possession. The possessing noun could be either an active in **-os* or an inactive in **-om*: cf. **w|k^{ho}-os* : **w|k^{ho}-iH* and **k^{her}Hsr-om* : **k^{her}Hsr-iH*.

Thus **-ī* < **-iH* is reconstructed as a derivational suffix that formed nominal stems belonging to either the active or the inactive class. Depending on its class, the stem took either the active ending **-s* (which was lost very early under phonetic conditioning: see I.3.1.8 above) or the zero inactive ending. From these marked formations in **-ī*, adjectival possessive forms later arise, parallel to the adjectives in **-os*, **-om*, and **-ā*. In a number of Indo-European dialects, these marked adjectives in **-ī* are later qualified as feminine adjectives: **w|k^{ho}ī* 'wolf's, of a wolf' (fem.), **rēk^ī* (-n-)-*ī* 'king's, of a king' (fem.), **ph|thHu-ī* 'of width, wide'. Later substantivization of such adjectives creates feminine nouns in **-ī*, cf. Skt. *vṛkī́-* 'she-wolf', *rājñī́* 'queen', *pṛthivī́* 'earth' (lit. 'wide'); for this process see Kurylowicz 1964: § 10, 218.

In those dialects where the possessive adjectival suffix **-ī* began to be used as a genitive (cf. Lat. *lupī*, *cerebrī*), it displaces the old genitive singular **-om* of active nouns:

**w|k^{ho}-om* : **w|k^{ho}-ī*

Evidence for this genitive singular can be seen in the Latin pronoun *uestrum* 'of each of you', corresponding to *uestri* 'your' as shown above for the Indo-European doublets:

uestrum : *uestri*
nostrum : *nostrī*

5.2.3. The development of the dative case and the locative in Indo-European and the formation of the nominal paradigm

The full Indo-European nominal paradigm reflected in the historical dialects took shape when forms for the dative and locative cases arose in the Indo-European inflectional system. The basic relations signaled by the dative and

locative cases in the historical Indo-European dialects — addressee, goal, and direction — would have been expressed in the earliest Indo-European system, with its binary noun class opposition, by nominal formations in **-om/-Ø* (the structural-syntactic inactive). This case was later transformed into the direct object case (the accusative) which in the historical Indo-European dialects shows both its basic function of marking the patient of a transitive verb and traces of an original diffuse function as marker of various relations which later came to be marked by separate cases (in particular, the dative and locative). That the prototype of the historical accusative was originally semantically diffuse or undifferentiated can be seen in constructions with a double accusative, e.g. Skt. *taṁ sarvasvam adaṇḍayat* ‘from him (*taṁ*, acc.) he takes as punishment all the possessions’; *satyaṁ taṁ rājaputram upeyatuḥ* ‘they came to the prince for justice’ (see Thumb and Hauschild 1959:II, § 237, 1, 19); cf. constructions with the dative in analogous functions, and also constructions like *Damayantīm anuvrataḥ* ‘devoted to Damayanti’ (acc.), the accusative with verbs meaning ‘follow’ (*anu-pra-sthā-*), and others.

The proto-accusative originally expressed relations of direction and goal as well. Note constructions with the accusative such as Skt. *āpo divam ud vahanti* ‘they bring waters to the sky’ (acc. *divam*), AV; *tāv ubhāv adhamām tamo nayati* ‘he brings them both to the deepest darkness’; Lat. *eō Rōmam* ‘I am going to Rome’; Hom. Gk. *ktēmata d’*, *hóss’ agómēn eks Árgeos hēméteron dō* ‘the possessions I carried away to our house from Argos’ (Iliad 7.363). Cf. the parallel constructions with accusative and dative expressing direction: *vanam gacchamaḥ* ‘we are going to the forest (acc.)’ and *vanāya pratiṣṭhati* ‘he sets off for the forest (dat.)’ (Speyer 1886:§ 79, 1896:§ 43; Haudry 1978:145ff.).

Thus the nominal formation in **-om*, which later became the structural-syntactic inactive and hence the protoform of the later accusative, expressed the relations of both direct object and oblique object, conveying the semantic functions of addressee and direction. In other words, the argument in **-om* expressed the patient and a number of other functions later taken over by dative, locative, and directional cases. The structural property of the earliest Indo-European nominal system, where two basic argument types, **-os* and **-om*, expressed all the basic syntactic relations, is a typical feature of a language with binary noun classification into active and inactive.¹⁸

A good illustration of the original formal non-differentiation of the dative and accusative comes from Old Hittite first- and second-person pronominals: *ammuk* ‘me, to me’ (dat.-acc.), *tuk* ‘you, to you’ (dat.-acc.); also the enclitic pronominals *-mu* ‘me, to me’, *-ta* ‘you, to you’, *-naš* ‘us, to us’, *-šmaš* ‘you, to

18. A typological parallel is the linguistic structure of Kartvelian, with its relic preservation of a binary opposition of nominal classes; in Kartvelian, the *-s* case marks the functions of both direct objects and dative and directional cases: Geo. *k’aci aḡlevs c’ign-s bavšv-s* ‘man gives book (*c’ign-s*) to child (*bavšv-s*)’; *midis kalak-s* ‘goes to the city (*kalak-s*)’; cf. also English constructions such as *he gave him a book, he went home*.

you (pl.)'. All these Hittite pronominals reflect the earliest stage of the Indo-European system, where there were two basic nominal forms which subsequently became the subject and object cases and expressed all the basic predicate-argument relations. A distinct dative-locative case which expressed addressee, direction, and goal appeared later, when the binary declension system with two basic arguments broke down and a more complex nominal paradigm arose.

Given these conditions, a number of functions originally expressed by the **-om* form were later transferred to newly arisen case forms which subsequently gave rise to the dative and locative, cases evidently of primarily adverbial origin. They were circumstantials which added specifications to the syntagma consisting of the verb and its core arguments.¹⁹

The dative in **-ei* and locative in **-i* in Indo-European amount to ablaut forms of a single circumstantial case, used respectively with active and inactive nouns. Subsequently, this case began to express the syntactic relations of the properly dative and locative cases which had earlier been expressed by the general inactive case in **-om*, **-Ø*. The **-ei* case (later the dative) was used with active nouns and the **-i* case with inactive nouns, as is shown by syntactic constructions of the Indo-European daughter languages, where the dative case is used only on nouns referring to people or personified objects (cf. Kurylowicz 1964:191, 196, Neu 1979:187).²⁰

This use of the dative explains its appearance in constructions with verbs of affect. This in turn shows that there was an additional subdivision of the active nouns into a subclass of animates capable of perception and a subclass of inanimates (e.g. plants, some animals, and others) which lacked this capacity. Distinguishing an affective construction requires a subcategory of nouns whose denotata are capable of perception — of seeing, hearing, feeling hunger, cold, pain, fear, etc. It is naturally these nouns that appear with verbs having the relevant meanings, in a special construction distinct from the one using **-os* with verbs expressing the general semantics appropriate for active nouns. The use of the dative in such constructions evidently reflects an ancient function of the dative, one going back to the initial stage of Indo-European.

Examples are constructions with dative subject such as OLith. *niežti mi* 'I

19. Cf. the dative and locative absolutes (with participial forms) in various Indo-European languages, e.g. the dative absolute with human subjects in Slavic: ORuss. *derevljanom* " *že prišedšim*", *povelě Olga mov* 'stvoriti' 'when the Derevljane had come, Olga ordered that a bath be prepared' (lit. 'the Derevljane [dat.] having-come [dat.]...'); Mstislavu *sědjaščju na obědě*, *pride emu vėst* 'while Mstislav was sitting at dinner, news came to him' (lit. 'Mstislav [dat.] sitting [dat.]...'); *i na dolžē borjuščemasja ima. nača iznemagati M'stislav* 'since they had been fighting for a long time, Mstislav began to get tired' (lit. 'they [dat.] fighting [dat.]'); for Old Church Slavic see Nečásek 1957. Cf. Skt. *astamana-velāyām* 'at sunset', *evam gacchati kālē* 'since the time passed that way'.

20. Recall the case classification of Fillmore 1968, where dative pertains to an animate object affected by the verbal action; cf. the dative with verbs of affect in Kartvelian: Chanidzé 1963, Schmidt 1974b.

(dat.) itch, feel an itch' [lit. 'to me (it) itches'] (Szyrwid) (Schmid 1963:69, Sabaliauskas 1957:111, Būga 1958-1961:II.388, 468, Stang 1942:100, 1966:316-17, Zinkevičius 1966:350); Latv. *kam niež* 'who (dat.) itches' [lit. 'to whom (it) itches'] (*niež* instead of archaic *niēzt*: Endzelīns 1951:572, 725-26); cf. Avest. *naēza-* (name of disease); Lith. *nesimiegojo ir Jonui* 'Jonas (dat.) too did not sleep' (Fraenkel 1928:117) (cf. Lith. dial. *miegmi* 'I sleep': Stang 1966:311, Sabaliauskas 1957:99-100, Zinkevičius 1966:349; the verb is cognate to OPruss. *meicte* 'sleeps', Russ. *mžit* 'squint, doze').

Hitt. [*ku-e-d*]a-ni-ik-ki *me-er-zi*, lit. 'disappears in relation to someone' (KBo XVI 25 I 43); *na-at-ták-kán me-er-du*, lit. 'and may [it] disappear for you' (KUB XVII 105 IV 24).

Some of the oblique forms preserved nondifferentiation in number for a long time, e.g. the adverbial **-bhi/*-bhi-s*: cf. Myc. *e-re-pa-te-jo po-pi* = *elephanteíos popphí* 'with ivory knives', *a-ra-ru-ja a-ni-ja-pi* = *araruā[i] hanlāphi* 'furnished with bits', etc. (Schmidt 1963, Lejeune 1958, cf. Šarypkin 1971).

5.3. The expression of possession in Indo-European

5.3.1. Verbal expression of possession as a reflex of the early Indo-European active structure. The verb 'be' in its possessive meaning

One of the oldest uses of the Indo-European dative case is in constructions with **es-* 'be' to express possession (Benveniste 1949, 1966a:188, 197; 1974; Watkins 1967, Allen 1964a:338). Constructions like Lat. *mihi aliquid est* 'I have something' (lit. 'to me is something'), cf. Hitt. *tuqqa UL kuitki ešzi* 'you have nothing' (lit. 'to you is nothing'),²¹ Gk. *estí soi khrosós* 'you have gold' (lit. 'to you is gold') reflect an ancient Indo-European construction with possessive semantics.²² It is important to note that there was no verb 'have' for this semantic relation, as is typical of active languages (Klimov 1973:217; cf. also Saxokija 1974).

The transformation of the construction type *mihi aliquid est* to *habeō aliquid* in the history of Latin reflects the appearance in the individual historically attested Indo-European dialects of a verb meaning specifically 'have', used both

21. Cf. A.NA *ṽTitiutti* NINDA.KUR₄.RA UDM¹ *UL ešzi* 'for the deity Titiutti there is no daily sacrifice' (KUB XXXVIII 14, Vs. 51).

22. This construction was preserved even where the verb **es-* was replaced, e.g. by *ta* in Old Irish: OIr. *ni-t-ta* 'you do not have' [lit. 'to you is not']; by *nes-* in Tocharian (Benveniste 1974:204: "one of the semantic functions of *es-* or its substitutes in constructions with the dative is the expression of possession, i.e. 'to be at' in the meaning 'be had'"), cf. Toch. B: *Nesām ksa nīl yesā-šc aīma-šše reki* 'to me is for you my own word' = 'I have something to say to you'; cf. the same constructions with Lith. *yrā*, Latv. *ir(a)* 'is'.

with independent possessive semantics and as an auxiliary verb²³ (Benveniste 1966a, 1974). Such verbs develop from verbs meaning 'hold', cf. Hitt. *ḫark-* 'hold', Lat. *arceō* 'hold, retain'; Gk. *ékhō* from PIE **seǵh-* 'hold' (Skt. *sáhate* 'overcomes'); cf. also Lat. *habeō* 'have' beside *inhibeō* '(I) inhibit, retain' from PIE **ghabh-* (OIr. *gaibid* 'catches, takes').

The possessive constructions with dative and the verb **es-* semantically admit negation of this relation. The construction *mihi est aliquid* 'I have something' (lit. 'to me is something')²⁴ takes the negation *mihi non est aliquid* 'I do not have something'.

5.3.2. The expression of alienable and inalienable possession

Negative forms in possessive constructions like those mentioned above, Hitt. *tuqqa UL kuitki ešzi* 'you have nothing', OIr. *ni-t-ta* 'you do not have', and similar constructions (in Baltic and Slavic, cf. OCS *jedīnomu něstŭ věnīca* '*uni non est corona*', 'one of them does not have a crown' [Supr. 58.16], *i ne bě ima čęda* '*kai ouk ēn autoŭs téknōn*' 'and they did not have a child (i.e. children)' [Luke 1:7; cf. Vondrak 1900:288, Toporov 1959:290-91, 1960:9, Benveniste 1949]) show that the possession they expressed was alienable (non-organic), i.e. the type in which the object is seen as not organically belonging to the owner, as something that can be alienated from the owner.

But language also has relational nouns which (in contrast to 'absolute' nouns) are seen as necessarily combined with some other noun. These include 'hand', 'brother', 'side', and others which in their very semantics presuppose association with another object: 'someone's hand', 'someone's brother', 'side in relation to someone'. Possession inherent in the semantics of the word is called 'inalienable' (organic) possession. Many languages make a formal differentiation in the expression of alienable and inalienable possession (Fillmore 1968), which reflects a principle of nominal classification that apparently holds within the active class.

We can see evidence of a formal difference in alienable and inalienable possession in Hittite possessive constructions. They have parallel forms: one with an independent possessive pronoun such as *ammel* 'my', *tuel* 'your', *apel* 'his', and one with an enclitic possessive pronoun *-miš*, *-mit* 'my', *-tiš*, *-tit* 'your', *-šiš*, *-šit* 'his'. In Old Hittite texts the enclitic pronouns are regularly used with

23. The diachronic change from the dative construction with **es-* to a construction with 'have' in various Indo-European dialects is due to universal semantic correlations of the various possessive constructions, correlations which can be inferred from typological comparison of languages (Fillmore 1968:61ff.).

24. For this function of the dative see also Boeder 1972.

relational nouns,²⁵ while independent possessive pronouns are used with absolute nouns: cf. OHitt. *a-a-ma an-zi-[el SAL].LUGAL URUKa-ni-iš XXX SAL.DUMU I.ŠU ḫa-aš-ta* ‘once our queen of the city Kanesh (Nesa) bore thirty daughters at once’ (KBo XXII 2 A, Vs. 12-13); cf. the typical use of the genitive personal pronoun *anzel* before titles, e.g. [*an-zi-el BE.LI* ‘our lord’, KBo XIV 12 IV 17, in Late Hittite, which is comparable to the Old Hittite usage: Otten 1973:31. This may indicate a formal distinction of alienable and inalienable possession.²⁶

An interesting typological parallel comes from Fijian, where inalienable possession is expressed by suffixal elements and alienable possession by preposed possessive pronouns: *ulu-qu* ‘my head’ (the part of my body), *kequ ulu* ‘my head’ (e.g. someone else’s head given to me as food): Lévy-Bruhl 1950:210-11, Milner 1971:409).

The opposition of alienable and inalienable possessive constructions proposed for Hittite presumably reflects the earliest Indo-European stage, where there was an opposition of possessive constructions based on the semantics of the possessive relation. Evidence for the opposition reconstructed from Old Hittite data can be seen in the possessive forms of historical Indo-European dialects, which point to the existence of two possessive pronominal constructions in the protolanguage: some dialects have independent possessive pronouns and others have enclitics which correspond etymologically to the Hittite possessive enclitics. Independent pronouns are Gk. *emós* ‘my’, *sós* ‘your’; Avest. *ma-* ‘my’, *θwa-* ‘your’; Ved. Skt. *tvá-* ‘your’ (RV, AV); enclitic: Lat. *meus*, voc. *mi* (cf. Hitt. voc. *-mi* in *atta-mi* ‘my father!’, *išḫa-mi* ‘my lord!’), OCS *mojŕ*, Goth. *mei-* in *meins* ‘my’ (Brugmann 1904, Schwyzler 1939:I.608, Szemerényi 1970:203, § VIII.4.5).

By comparing the independent and enclitic pronominal forms of these Indo-European dialects, we can reconstruct for the source language two parallel series of pronominal possessives, independent and enclitic, i.e. the situation reflected in Hittite. This again confirms the Proto-Indo-European character of an opposition ascertained from the historical data of Hittite.

25. Hitt. *attaš-miš* ‘my father’, *ešḫaš-miš* ‘my lord’, *keššaraš-miš* ‘my hand’, *ker-met* ‘my heart’, *laman-mit* ‘my name’, *pir-mit* ‘my house; my household and family’, *kattan-šet* ‘his lower part’, *piran-šet* ‘his front side’, etc.

26. Note the independent 3sg. possessive *šel* instead of *-šiš*, *-šeš* in the Old Hittite Hattusilis bilingual: *ši-i-e-el ṚMES.ŠU [I.NA 1 AM]A ḫa-aš-ša-an-te-eš* ‘his subjects were born from [one mother]’ (HAB II 47); cf. *kainaš-šeš* ‘his affinal kin’, with enclitic, in the Telepinus text.

5.4. The binary structure of the Indo-European pronominal system

5.4.1. Inclusive and exclusive

The binary classification of nouns into active and inactive classes reconstructed for the earliest Proto-Indo-European can be seen with particular clarity in the pronominal system. The personal pronouns of Indo-European are oriented not toward grammatical gender oppositions, which arose only much later when the individual dialects developed, but toward a classification based on two basic groups, active and inactive. This can be seen in the fact that there are two basic demonstrative pronoun forms, **is* 'this' (masc., fem.) and **it*' (neut.), where **is* is associated with nouns of the active class (historically the masculine-feminine or common gender) and **it*' with inactives (historically the neuter gender):²⁷ cf. Lat. *is, id*; Goth. *is, it-a*; Skt. *ay-ám* (masc.), *iy-ám* (fem.), *id-ám* (neut.). The evidence of these dialects coincides with the Hittite data, where the pronominal system, like the nominal system, shows a grammatical classification into two genders, common and neuter, reflecting the Indo-European opposition of two noun classes, active and inactive.

The original binary nominal classification of Indo-European is also evident in the fact that the pronominal system has an inclusive/exclusive category. On general typological grounds, a linguistic structure with a binary nominal classification such as active vs. inactive, animate vs. inanimate, person vs. thing, etc. would imply the existence of an inclusive/exclusive category in the pronominal system (as in most Australian, Austronesian, and Dravidian languages, some African languages of the Niger-Congo group, many Amerindian languages, and Caucasian languages). The inclusive/exclusive category involves an opposition of two first-person plural pronouns, one expressing first plus second person (inclusive 'we', where the referents belong to the same class, as they are both speech-act participants) and the other first plus third but not second person (exclusive 'we', where the referents belong to different classes).

When two such classes receive strict formal distinction in a language, the expression system naturally distinguishes first-person pronominal forms referring to elements of the same class from those referring to elements of different classes. In other words, binary classification of nouns in a language implies the inclusive/exclusive category in the pronominal system (Gamkrelidze 1959:11). The Indo-European linguistic system, with its binary classification of nominals into active and inactive classes, should show traces of an inclusive/exclusive opposition in the pronominal system.

27. See I.3.1.9 above for the possibility that the pronominal markers **-s* and **-t^h* (**-t'*) were related to the nominal markers of the active and inactive classes; and the typological parallel involving secondary affixation of these pronominal markers to the two noun classes in Lydian, *ibid.*

And in fact two forms can be reconstructed for the first person plural in Indo-European: **wei-* (**wes*) and **mes*, with the historical dialects showing one or the other: Skt. *vayám*, Avest. *vaēm* (= **vayəm*), Goth. *weis*, Hitt. *weš*, Toch. B *wes*, and Lith. *mēs*, OCS *my*, Arm. *mek'*. The fact that two first-person plural pronominal stems can be reconstructed for Indo-European becomes comprehensible if they can be distinguished semantically and defined as inclusive and exclusive forms (see Prokosch 1954:308-9, 1939, Liebert 1957:95-107, Benveniste 1959a). The fact that the initial element of **wei-* coincides with the second-person plural form (cf. OCS *vy*, Lat. *uōs*) may be evidence that PIE **wei-/wes* was inclusive, in opposition to **mes*, which would have been exclusive.²⁸ This interpretation also clarifies the fact that **we-* is used in the dual in Balto-Slavic and Germanic: Lith. *vè-du*, OCS *vě*, Goth. *wit* 'we two'.²⁹

When the binary noun-class structure of Indo-European was disrupted, the inclusive/exclusive category that had been motivated by it was eliminated from the pronominal system. As a result, only one of the two first-person pronoun forms was preserved as the general first-person pronoun in any one dialect. In Balto-Slavic and Armenian the stem retained was **mes*, while in Indo-Iranian, Germanic, Anatolian, and Tocharian it was **wei*.³⁰

5.5. The binary structure of verbal categories

5.5.1. Doublet verb lexemes as a reflex of the binary semantic classification of nouns into active and inactive

The binary active/inactive classification of nouns reconstructed for earliest Indo-European, with all its structural implications for the system of nominal declension, led naturally to a division of the verbal formations into two structural-

28. Based on the same typological considerations whereby the inclusive first person contains elements of second-person markers (Forchheimer 1953:98ff., 114 et pass.), another conclusion has been drawn, namely that inclusive forms are reflected in Skt. *-asma-* (the oblique stem of the first-person plural pronoun), Aeol. Gk. *ámmes* < **asmes*, Lat. *nōs*, Goth. acc. *yuš(is)*, since they contain the same *-s* as the second-person plural oblique pronoun forms Skt. *yušma-*, Aeol. Gk. *úmmes* < **usmes* (Ehrt 1970:38-41, 1973:253).

29. In an excursus devoted to the question, Watkins 1969:46-48 adopts the hypothesis that the dual is secondary in Indo-European and reconstructs Proto-Indo-European pronominals **we-*, **ne-*, **yu-* (and the corresponding verbal endings **-we*, **-me*, **-the*) with the respective meanings of first person inclusive, first person exclusive, and second person. He claims that "only later, through loss of the inclusive/exclusive opposition and expansion of the category of dual (from the noun?) did there occur a redistribution in the various languages" to other meanings; for inclusive **we*, exclusive **ne* see also Jensen 1930; cf. the exclusive **na-* of Proto-Kartvelian (Gamkrelidze 1959:46-47).

30. Cf. the analogous development of the inclusive-exclusive category in the Kartvelian pronominal systems: the Proto-Kartvelian exclusive first-person plural *na-* is preserved as a general first-person plural in Svan, while Georgian and Laz-Mingrelian retain the Proto-Kartvelian inclusive **čwen-* (Gamkrelidze 1959).

semantic classes: the active verbs, which took only active arguments, and the inactive verbs, which combined syntactically with inactive nouns.

The division of the verbs into two subsets implied by the binary noun classification leads naturally to a semantic grouping of verb forms into two classes based on whether they expressed active or inactive semantics. The original semantic principle for classification of the Indo-European verb forms was not transitivity, which is a semantic opposition independent of nominal classification,³¹ but a semantic classification into active and inactive, depending on the nature of the verbal action or state expressed.³²

Depending on whether verbs took active or inactive nouns, doublet lexemes arose for verbs whose semantics allowed combination with respectively active or inactive nouns, as with *be*, *lie*, *fall*, *move*, etc.;³³ in addition, morphological markers arose, associated with active and inactive nouns. Remnants of doublet verb lexemes for active and inactive classes are verbs such as PIE **es-* 'be' / **bhūH-* 'be', **ses-* 'lie, sleep' / **k̑hei-* 'lie', **sth-aH-* 'stand' / **or-* 'stand', **es-* 'sit' / **set'-* 'sit', etc.³⁴

The two series of personal markers on verbs reconstructed for Proto-Indo-European are what are known as the primary and secondary endings on the historically attested present and aorist, **-m(i)*, **-s(i)*, **-th(i)*, and the original

31. The autonomous nature of the semantic classification of verbs into transitive and intransitive explains the fact that many languages with a transitivity opposition lack consistent nominal classification (other than gender, which has no direct connection to transitivity). Consequently, verbal classification by transitivity is not structurally motivated by any nominal classification. Hence it is impossible to accept the hypothesis of Pedersen 1905:129ff., 1933, 1938:80-86 to the effect that Indo-European had an opposition of transitive to intransitive conjugations connected with an ergative/non-ergative distinction in nouns. This semantic characterization of verbal and nominal oppositions, advocated by Pedersen and later scholars (for a critique see Watkins 1969:66, §46), is not consistent with the facts from the Indo-European languages, which point to a late development of the transitivity category (Desnickaja 1951). Although Pedersen correctly noted the formal opposition of two types in the verb and in the noun, his semantic interpretation was incorrect.

32. The facts from many ancient Indo-European languages show that the transitivity opposition in verbs was a secondary development in the history of Indo-European; cf. the earlier division into energetic and non-energetic verbs which subsumed the transitivity/intransitivity opposition (Schwyzer and Debrunner 1950:II; see Schmidt 1973 for comparison to Northwest Caucasian). A number of verbs which are transitive or intransitive in the daughter languages can be reconstructed for an earlier stage as indeterminate or transitive-intransitive, not consistently transitive or intransitive: cf. Hitt. *ḫark-* 'perish', *ḫarkta* 'was perishing' (caus. *ḫarganu-*, *ḫarnink-* 'destroy'), OIr. *-ort* < **or-k-t* 'destroyed': Desnickaja 1951, Ivanov 1965:62.

33. Cf. the doublet verbs in attested active-type languages, e.g. Navajo: *t'í* 'be (of people, animals)' / *t'él* 'be (of objects)'; *tín* 'lie (of people, animals)' / *-á* 'lie (of things)'; *hááh*, *-ya* 'move (of people, animals)' / *kèès* 'move (of things)': Reichardt 1951:352-57.

34. According to Bader's recent findings (1976:108), the verbs **es-* 'be', **ei-* 'go', **(a)u-* 'see' (Hitt. *uḫhi*), **et-* 'eat', **ekho-* 'drink', and others were originally inactive and only later shifted to the active series.

perfect and middle markers **-Ha*, **-thHa*, **-e³⁵* (cf. Gk. *oîd-a*, *oîs-tha*, *oîd-e*, Skt. *véd-a*, *vét-tha*, *véd-a*). They must ultimately have been correlated with a distinction of verbal arguments according to active and inactive classes. Significantly, the members of the doublet pairs given above are formally opposed in their ending series:

***-m(i) series**

PIE **es-* 'be' (Hitt. 1sg. *eš-mi*,
eš-zi, Skt. *ás-mi*, *ás-ti*, Gk.
eimí, *estí*, Lat. *sum*, *est*,
OCS *es-mŭ*, *es-tŭ*)

PIE **ses-* 'lie, sleep' (Hitt.
3sg. *šeš-zi* 'sleeps', Skt.
sásti 'sleeps')

PIE **sthaH-* 'stand' (Gk. 1sg.
hístēmi, Skt. 3sg. *tīṣṭhati*,
Avest. 3sg. *hištaiti* 'stands',
cf. Hitt. *tiyami* 'I come forth')

***-Ha series**

PIE **bh_uH-* 'be' (Skt. 1sg.
perf. *babhūva* 'I was, became',
Gk. perf. *péphūka*, Lat. *fuī* 'I
was', OE 1sg. *bēom* 'be')

PIE **k_hei-* 'lie' (Hitt. 3sg.
mid. *kittari* 'lies',³⁶ Gk. *keîtai*
'lies', Skt. *śéte* 'lies')

PIE **or-* 'stand, stand up'
(Hitt. 1sg. *arḫaḫari*, Gk.
ōrto, Lat. *orior* 'I stand up')

5.5.2. *The two series of verbal endings, *-mi and *-Ha, associated with active and inactive arguments. Their reflexes in Hittite and elsewhere*

Of the two ending series, **-m(i)* apparently occurred with an active argument and **-Ha* with an inactive argument. This interpretation is plausible in view of the semantics of the verb structures that subsequently develop from forms with the endings **-Ha* and **-m(i)*.³⁷ Those with **-Ha* underlie the perfect and middle

35. For the historical connection of the Indo-European mediopassive to the perfect see Kuryłowicz 1932, cf. 1956:41-44, 1964:56-89, 1977:65, Stang 1942:29ff., Watkins 1969:66-67, Puhvel 1970, Cowgill 1972:924-25; for the Indo-European active and middle endings see also Schmalstieg 1976.

36. Cf. *ki-* 'lie', 'exist' with names of inanimates in the Old Hittite text KBo XV 10 I 8: KÛ.BABBAR GUŠKIN NA₄ZIGI NA₄KÁ.DINGIR.RA NA₄pa-ra-aš-ḫa-aš NA₄DU.ŠI NA₄lu-ul-lu-ri NAGGA URUDU *ki-it-ta* 'there is (lies) (i.e. is present) silver, gold, lapis lazuli, Babylonian stone, *parašḫa-*, mountain crystal, *lulluri*, tin, and copper'. In the ritual text KBo XVII 1+I 31': *še-er-še-me-ta* [G]IR ZABAR *ki-it-ta* 'and over them (above them) a bronze knife lies', cf. also Hitt. *na-aš-za a-ar-ši-ki-it ta wa-a-tar DINGIRMEŠ-aš e-eš-ri-ya ku-it ki-it-ta-ti* 'and it (stream) flows, and the water that lies on the images of the gods' (KUB IX 28, Rs. IV 5-6).

37. Evidence for the morphological opposition of active and inactive nouns can also be seen in the paradigms of certain Indo-European verbs, in particular **es-* 'be'. This root was described above as associated with active nouns and taking **-mi* conjugation, in opposition to

formations of most dialects and the *-hi/-ha* conjugation of Anatolian.

The original function of the Indo-European perfect was to indicate a state resulting from prior action: cf. Hom. *éōika* 'be similar', *ódōda* 'smell' (Chantraine 1927). Hence we can establish a natural formal and semantic connection between the endings **-Ha*, **-thHa*, **-e* and the Indo-European mediopassive, cf. Hom. Gk. *héstēka* 'I stand' beside *hístamai* 'I get up, become', *egrēgora* 'I am awake' beside *egeíromai* 'I wake up' (Wackernagel 1924:168). The Hittite *-hi* conjugation primarily involves verbs which correspond to mediopassives elsewhere, cf. Hitt. *paḥḥašhi* and Lat. *pāscō* 'I herd, graze (livestock)', Hitt. *arḫi* 'I achieve, reach' and Lat. *orior* 'I get up, stand up' (Rozenkranz 1953, 1958).

There is a perfectly obvious historical relation of the Hittite *-hi* conjugation, with endings 1sg. *-hi*, 2sg. *-ti*, 3sg. *-i* (present) and 1sg. *-hun*, 2sg. *-ta*, 3sg. *-ta* (past), to the mediopassive endings 1sg. *-haḥa(ri)*, 2sg. *-ta(ti)*, 3sg. *-ta(ri)*.

This development of verb forms with **-Ha* endings in the Indo-European dialects is a fairly unambiguous indication of the original functions of the endings of this series. They were originally markers associated with inactive arguments, opposed to the **-mi* series, which were exponents of active nominals as arguments.

The semantic interpretation of the paradigm in **-Ha*, **-thHa*, **-e* as used with inactive nouns makes it possible to determine its later nature in comparison to the **-mi* paradigm. Given the semantic properties of verbs taking inactive nominals, the **-Ha* paradigm must have been defective in comparison to the **-mi* paradigm. The semantics of inactive nouns precludes first- and second-person forms for the **-Ha* series,³⁸ since inactive nouns are semantically incapable of being speech-act participants. Hence a one-place inactive verb originally had only the third-person singular form in **-e*. The third 'person' form was therefore structurally impersonal, without paradigmatic oppositions for person.

An early Indo-European syntagma consisting of inactive noun plus verb in *-e* would have been in effect a predicative adjectival construction, designating a state or quality of the referent of the inactive noun. The predicate had the force not of a properly verbal form but of an adjectival (nominal) form in predicative function. For example, the Indo-European inactive syntagma **akḥmen kḥei-e* '(a) stone lies'³⁹ or **wot'orth ph₁H-e* 'the water is wide' or **nebhse-leukh-e* 'the sky is bright' contained a predicative element which could be

**b^{hu}H-*, which took inactive nouns and **-Ha* conjugation. However, a number of morphological forms of **es-* in individual Indo-European dialects may point to an old active/inactive opposition for this root, marked by **-mi* vs. **-Ha* conjugation. Relic forms in **-Ha* can be seen in Luw. *ašha* 'I was' and others (see Bader 1976), unless these are later innovations in the individual languages.

38. For the first and second persons as speech-act participants and the third person as an object of communication, see Benveniste 1966a, 1974, Jakobson 1971b:II.130ff.

39. Cf. OHitt. *linkiya kattan kiya* 'is subject to curse' (KUB XXXVI 109, 11); Watkins 1969:86, § 68.

interpreted with equal ease as an impersonal verb (i.e. a verb form without a person opposition) or as an adjective in predicative function.

It is this predicative structure in inactive constructions that underlies the most archaic adjectives (as noted by Kuryłowicz 1956:44) in **-e/o*, e.g. **leuk^h-e*, as well as thematic adjectival elements of compounds such as Hitt. *šallakard-* 'big heart' (in the derived verb *šallakardai-* 'harm or make angry through arrogance'), Hitt. *pattar-palḫi-* 'wide-winged' (lit. 'wing-wide'), cf. Lat. *palūs*, gen. *palūdis* 'swamp', Russ. *polovod'e* 'high water' (Trubačev 1972).

The rise of a full paradigm with three persons for verbs used in constructions with inactive nouns is of a later date and due to the influence of paradigms of two-place verbs used with an active noun as agent and an inactive noun as patient. In a two-place construction when both nouns were active, the verb took endings of the **-mi* series as markers of the active nouns.

We can reconstruct the following paradigmatic conjugation model for verbal forms with active arguments (A = active noun; V = verb; In = inactive noun; superscripts show structural-syntactic status [later case marking], cf. 5.1.4 above):

	Agent		Predicate		Patient
1p.	A	————	V- <i>mi</i>	————	A ^{In}
2p.	A	————	V- <i>si</i>	————	A ^{In}
3p.	A	————	V- <i>ti</i>	————	A ^{In}
	Person		kills		animal

This ancient Indo-European paradigm is well attested in many Indo-European dialects.

However, in addition to the paradigm for two-place verbs with two active arguments, there also had to be constructions in Indo-European where a two-place verb took an inactive patient and an active agent, e.g. **person moves stone**. In a language with a strict active/inactive distinction in nouns, this construction must have been marked by a different verbal structure than that with two active nouns.

The structural distinction was indicated by the second series of person markers, **-Ha*, **-thHa*, **-e*, which indexed the inactive argument:

	Agent		Predicate		Patient
1p.	A	————	V- <i>Ha</i>	————	In
2p.	A	————	V- <i>thHa</i>	————	In
3p.	A	————	V- <i>e</i>	————	In
	Person		moves		stone

The **-e* in this paradigm is evidently the same marker as the **-e* of one-place verbs with inactive arguments. Thus in the syntagma *A + V-e + In* the verb

form contains an exponent of the inactive argument functioning as patient.

The first- and second-person markers **-Ha* and **-thHa* are to be interpreted analogously. The second-person formative **-thHa* contains an element **-Ha* identical to the first-person marker, and is a compound formation **-th-Ha*, where the **-th-* indexes a second-person active argument (cf. the root in **th-* in personal and possessive pronouns: Hitt. *zik*, acc. *tuk* 'you', *-ta* 'you' (dat., acc.), *-tiš* 'your', *-tet* 'your' (neut.), Skt. *tvám*, Lat. *tē*, etc.) and the **-Ha* indexes the inactive noun functioning as patient. The same marker appears in the first-person form **-Ha* with a zero marker of the active agent.⁴⁰

Thus the first-person construction

A ——— V-*Ha* ——— In

should be rewritten as

A ——— V- \emptyset -*Ha* ——— In

while the second-person construction is

A ——— V-*th-Ha* ——— In.

This paradigm for two-place verbs with an active and an inactive argument is best preserved in Hittite, in the transitive verbs of the *-hi* conjugation.

In the historical development of the Anatolian languages, specifically Old Hittite, we can see a tendency to use transitives in *-hi* with inanimate (neuter-gender) direct objects. Transitive verbs of the *-hi* conjugation such as *da-* 'take', *dai-* 'put', *pai-* 'give', *mema-* 'say', *nai-* 'turn, send, bring', and others take primarily neuter direct objects. In this we can see a clear connection to the ancient Indo-European constructions with a verb in **-Ha* and inactive arguments.

Old Hittite examples: *GIŠTUKULHI.A-uš-šu-uš-ta ZAG.LU-za da-aḫ-ḫu-un nu-uš-ma-aš GIŠX pí-iḫ-ḫu-un* 'I took the weapons from their shoulders and gave them (something wooden)' (*Tel.*, BoTU 23 A II 30); [*na*]-*at-ta-aš-ta ku-it-ki ku-e-da-ni-ik-ka da-aḫ-ḫu-un* 'I took nothing from anyone' (BoTU 14a, Rs. 4).⁴¹

nu-uš-ša-an KUR-e še-er KUR-e te-eḫ-ḫu-un 'and I put country onto country' (*HAB*, BoTU 8 III 15); *ke-e-ša-an ḫu-u-ma-an-d(a) [p]ád-pa-ni-i te-e-eḫ-ḫi* 'all this I put into a basket' (KBo XVII 1 IV 20-21).

URUŠa-la-ti-wa-ra me-e-ni-me-et ne-e-eḫ-[ḫu-un] 'I turned my face to the city Salatiwara' (BoTU 7, 58); *A.NA GIŠGIGIR-ya-kán GIŠGIGIR me-ek-kán*

40. For the typology of active languages see Klimov 1973:222.

41. Cf. the Hittite use of a *-mi* verb: *ep-* 'catch, take' (Skt. *āpnóti* 'I reach, attain', ppl. *āptá-*; OLat. *co-ēpi* 'began', Lat. *apīscor*, *āpius* 'reach, attain') primarily with animate nouns: *LUGAL-ša-an e-ip-pu-un* 'I, the king, grabbed him' (*HAB*, BoTU 8 II 8); *UṢNÍ.ZU-an na-at-ta e-ip-zi* 'he does not catch him like a thief' (Hittite Laws, § 66, KBo VI 2 III 50); *nu LUGAL-un e-ip-pir* 'and they grabbed the king' (KBo XII 14, Rs. 6); *ma-a-an [MUŠEN]ha-a-ra-na-an ḫu-š(u-wa-an-da-an ap-pa-an-zi)* (KBo XVII I+II 19) 'if they catch the eagle alive'.

ne-eh-hu-un 'and to the chariots I directed many chariots' (i.e. 'I significantly increased the number of chariots') (KUB XXXVI 98b, Rs. 11).

The complete **-Ha* paradigm of two-place verbs with an inactive argument, where the third-person form in **-e* functioned as an impersonal one-place verb with an inactive argument, subsequently turned into a special conjugation with primarily inactive semantics (reflecting the original participation of the inactive argument in the verbal action). As a result, the **-Ha* paradigm extended to one-place verbs with an inactive argument. This process testifies to loss of the strict binary active/inactive classification of Indo-European nouns and reanalysis of the noun classes as grammatically agreeing nominal formations without regard to their semantic activity or inactivity. This in turn led to redistribution of the nouns among the groups.

Thus out of the one-place impersonal 'verbal' paradigm *In V-e* arises a full paradigm with three person forms (examples above):

1sg.	In V- <i>Ha</i>
2sg.	In V- <i>thHa</i>
3sg.	In V- <i>e</i>

In this paradigm the symbol *In* no longer has its original meaning of indicating a noun of the exclusively inactive class. Rather, it indicates the historical connection of the argument in such a paradigm with inactive nominals.

This one-place verb paradigm in **-Ha*, like the two-place paradigm in **-Ha*, is directly reflected in Hittite intransitive *-hi* verbs: 1sg. *arhi* 'I attain, reach', 2sg. *arti*, 3sg. *ari*; 1sg. *gangaḫhi* 'I hang', 3sg. *gangi*.⁴²

5.5.3. The historical relation between the Indo-European perfect and middle

The one-place paradigm in **-Ha* that developed with arguments historically reflecting inactive nouns carries the meaning of a state of the subject. From this general meaning for the paradigm, verbal forms like the Indo-European perfect and mediopassive, with a meaning of action on or for oneself, subsequently arose in individual dialects (see Jamison 1979, 1979a).

The oldest reconstructible function of the Indo-European perfect was to express a state (often psychological) or property of the argument (cf. Perel'muter 1977:5ff.). In some dialects, reduplication becomes a frequent formal device opposing the original root to the perfect form: cf. Gk. *mémōna* 'wish', Lat. *meminī* 'remember', Goth. *man* 'think'; Gk. *oīda*, Skt. *véda*, Goth. *wait* 'know'; Lat. *(g)nōui*, Goth. *kann* 'know'; Skt. *dadhārṣa*, Goth. *ga-dars* 'dare'.

A meaning often expressed by perfects in Indo-European is the sound emitted

42. For the Hittite *-hi* conjugation and its place in the Indo-European conjugation system see also Cowgill 1979, Jasanoff 1979, Kurylowicz 1979, Lindeman 1979, Kammenhuber 1980.

by the referent. The verbs thus express a property of the referent, namely its ability to emit particular sounds. The origin of verbs of sound in Indo-European perfects explains their reduplicated form and their vocalism in the daughter dialects, cf. Hom. Gk. *tétriga* 'chirp', *gégōna* 'shout, cry, be audible', *mémuka* 'moo', *bébrukha* 'roar, growl', etc. (Perel'muter 1967:90, 93-94;⁴³ for archaic forms of the Indo-European perfect see also Adrados 1963:100ff.).

The same inactive **-Ha* paradigm underlies the earliest Indo-European middle, which has the endings 1sg. **-Hai*, 2sg. **-thHai*, 3sg. **-ei*; its original meaning was action on or for oneself as opposed to action in general. This meaning can easily be derived from the originally inactive meaning of the **-Ha* paradigm.

Such middles are well preserved in the individual daughter dialects, cf. Hitt. 1sg. *ešhaḫari* 'I sit down', 2sg. *eštari*, 3sg. *ešari/eša* 'he sits down'; 1sg. *arḫaḫari* 'I stand', 2sg. *artati/artari*, 3sg. *artari/arta*; Skt. *bruv-é* 'I speak', Avest. *mruy-ē*, OCS *věd-ě* 'I know' (Kuryłowicz 1965a:54; cf. perfects with the same meaning: Gk. *oīda*, Skt. *véda*); Lat. *meminī* < **memenai* 'I remember' (cf. perfects with the same meaning: Gk. *mémōna*, Goth. *man*), cf. Slav. *mīni(tŭ)* 'thinks' (for the Slavic type in *-i-* see Kuryłowicz 1965a, 1973b:43, Ivanov 1968), Lith. *mini* 'thinks'.⁴⁴

5.5.4. The suffix **-nth-* as a marker of membership in the active class. The origin of the **-nth-* participials in Indo-European

In the ancient Indo-European system where nouns were classified into a binary active/inactive opposition, deverbal nouns were formed by adding suffixes that nominalized verb bases and marked the derived stems as belonging to the active or inactive class. One of the commonest suffixes with this function was **-[o/e]nth*, which became a sort of marker of active nouns; it was opposed to **-r*, which formed inactive deverbal noun stems.

43. The properties of the ancient verb forms that developed into the perfect are also reflected in the vocalism of reduplicated forms such as Hitt. *pariparai-* 'he plays (a wind instrument)' (*-hi* conjugation: Watkins 1969:§ 7, 31, q.v. for comparison with Skt. *sanīṣvanat* 'sounds', RV VIII, 69, 9; OCS *glagoljŭ* < **golgol-yo-* 'I speak, talk'; for verbs of speech with *-hi* conjugation see also Cowgill 1972). Cf. the *o* vocalism in forms like Slavic **stonjŭ* (Russ. *stonu* 'I groan') beside Ved. 3sg. injunctive *stan* 'thunder resounds'; **sopŭ* (Russ. *soplju* 'I sniff'), **pojŭ* (Russ. *poju* 'I sing'), **godŭ* (Russ. *gužu* 'I buzz, whistle') (Meillet 1906, Stang 1942:41-43, 103; Schmid 1963:71, 73; Stang 1966:312); cf. Slavic **tortoriti* > Czech *tratořiti*, Russ. *taratorit'* 'chatter' beside Luw. *tatariya-* 'curse', Hitt. *tar-* 'speak' (van Brock 1964:141, Ivanov 1968:242-48). As a typological parallel, the Yeniseian languages, in particular Ket, have a distinct grammatical class of verbs of sound (Krejnič 1968:114-21, Ivanov 1970).

44. According to Bader 1975, 1976, there was a 'voice' opposition at an early stage of Proto-Indo-European, expressed by thematic forms in **-e/o-* with 'middle' voice. Given the evidence for **-e/o-* associated with originally inactive verbs, it should rather be assumed that the **-e/o-* forms were originally inactive.

Clear examples of the two formations are the deverbal nominals **(e)t'-onth-* and **et'-r-*, respectively active and inactive, from the root **et'*- 'eat'. **(e)t'-onth-* acquires the active meaning 'that which eats, eater' > 'tooth' in the historical languages: Hitt. *adant-* 'eating, eater',⁴⁵ OCS *ěd-ęt-* 'eating, eater', Skt. *da(n)t-*, Avest. *dantan-*, Gk. *odōn*, Arm. *atamn*, Lat. *dēns*, OIr. *dét*, Goth. *tunþus*, OHG *zand*, Lith. *dantis* 'tooth'.⁴⁶ Also descended from this type of nominal derivative is the active participle in **-nth-*, reflected in all Indo-European dialects.

In contrast to these forms we find an **-r* derivative of the same verbal root with clearly inactive semantics: Hitt. *etri* 'food, fodder' (KBo X 37 II 17, Goetze 1962:30), cf. Hom. Gk. *eídār*, gen. *eídatos* 'food (as something served)' (Chantraine 1964:16), Lith. *ėdrà* 'fodder for livestock'.

There is an analogous opposition of originally active and inactive stems from the same verb root in Hitt. *ašant-* 'being, true, real' (cf. Skt. *sánt-* 'existing, real', Avest. *hant-*, Gk. *tà ónta* 'truth', Lat. *sōns* 'guilty, punishable, criminal', cf. Benveniste 1974, 1966a:160, 188; OIcel. *sannr* 'true', OE *sōð* 'truthful, actual') and Hitt. *ešri-* 'image, depiction; appearance, aspect' (Ivanov 1968:233-34).

The same marker **-nth-* is later used not only for active nominalizations but also for transforming inactive nouns to active:

In + *-nth-* → A

It is the formal marker of a semantic process of activation (personification, animation) of nouns originally of the inactive class. This formal-semantic transformation of original inactives is most visibly reflected in Hittite derivatives of common gender in **-nt-* from neuters, in constructions with transitive verbs in *-mi* (Laroche 1962, Tschekhoff 1978):⁴⁷

45. It is important to emphasize that **-nth-* formations originally referred to active nouns. This was also reflected later, when true participials of various genders in **-nth-* had formed. Even the later passive participles in *-nt-* preserve a clear connection with the old active class, in that they primarily combine with animate semantemes: cf. Hitt. *appanz(a)* 'captured, captive', Lat. *sōns* 'punishable', etc.

46. For the connection of 'tooth' to **et'*- 'eat' see Kořinek 1934:151, ex. 429, Ivanov 1968:238-39, Oettinger 1979:89, note 14.

47. In semantically analogous constructions, some neuter nouns form actives by compounding with a second element *-šepa-*, cf. *tekan* 'earth' (neuter) but *dagan-šipa-* 'earth' as the personified Earth Spirit (cf. the same second element in names of gods: *Kamru-šepa-* [Laroche 1947], *Ḫanta-šepa-* 'Forehead Spirit' [Kammenhuber 1961b:185, Čop 1960]); cf. in the same Fire Curse text *IŠ.TU ŠU-ma-kán GIG.ŠU MI-iš KI-an-zi-pa-aš kar-ap-du* 'may the Dark Earth throw the disease away from him with its hand', KUB XVII 8 IV 9 et pass.; Hitt. *-šepa-* probably goes back to PIE **sebh^ho-*, reflected in OCS *sobl'* 'peculiarity, feature', Russ. *o-soba* 'individual', OPruss. *subs* 'oneself', etc.

Neuter gender	Common gender
<i>watar</i> (gen. <i>wetenaš</i>) 'water'	→ <i>wetanant</i> - 'water' (as active force): <i>kuedani-wa uddani uwanun numu</i> <i>TÚL-anza punušdu witenanza</i> 'I have come for a reason, may the spring and water ask me'
<i>ešhar</i> (gen. <i>ešhanaš</i>) 'blood'	→ <i>ešhanant</i> - 'blood' (as active force): <i>ešhananza ešhanaš inan karapzi</i> 'blood removes disease of blood'
<i>šeḥur</i> (gen. <i>šeḥunaš</i>) 'urine'	→ <i>šeḥunant</i> - 'urine': <i>man-an-za-kán šeḥunanza-pát tamašzi</i> 'if his urine makes pressure by itself...'
<i>uttar</i> (gen. <i>uddanaš</i>) 'word'	→ <i>uddanant</i> - 'word' (as active force): <i>na-at-za ammel uddananteš tarahḫir</i> 'and my words subdued them'
<i>utne</i> 'country'	→ <i>utneyant</i> - 'country': <i>utneanza kurur epzi</i> 'the country begins to be at war'
<i>nepiš</i> 'sky'	→ <i>nepišant</i> - 'sky' (as active force): <i>na-an-za še-er na-pí-ša-an-za tar-aḫ-du</i> 'and may the Sky above defeat it (disease)' (KUB XVII 8 IV 9, 'Curse of the fire goddess Kamrusepa')

Traces of analogous transformations can be seen in other Indo-European dialects, e.g. in Skt. *himá*- (neut.) 'snow' → *hemantá*- 'winter' (masc.). A neuter meaning 'winter' is evidently represented in the old locative formation *héman* 'in winter'. The original neuter can be reconstructed as **ǵheim-om* (cf. Gk. *kheimṓn*), which was transformed into an active **ǵheim-onth-*, found in Skt. *hemantá*-, Hitt. *gimmant*- 'winter' (Benveniste 1962b). The Hittite dative-locative *gimmi* 'in winter' (KUB XIII 2 IV 223), *gemi* (KUB XIII 1 IV 12; XXX 37 I 9, 11), *gimi* (IBoT II 6 II 10) (Goetze 1951:467) points to a neuter source **geman* (cf. Hitt. *pedan* 'place' beside dat.-loc. *pidi*), comparable to Skt. *héman*, Gk. *kheimṓn*.

A parallel correspondence can be reconstructed between the neuters Gk. *éar* 'springtime', Lat. *uēr*, Skt. *vasar*- 'in springtime' (loc.) and the 'animate' forms in *-*nth-* of Skt. *vasantá*- 'springtime' (masc.) (cf. the same suffix on another stem in Hitt. *ḫammešḫant*- 'springtime' beside *ḫamešḫi* 'in springtime', loc. *man ḫamešḫi*, KUB X 27 I 22, *ḫamešḫi kišari*, KUB XIII 32, Rs. 7).

5.5.5. The verb endings *-nth- and *-r- and the plural paradigm of the verb

The active and inactive endings *-nth- and *-r-, respectively, can be connected to the third-person plural markers of the verbal conjugations in *-mi and *-Ha.⁴⁸ In third-person plural forms of the *-mi series we find the marker *-*[e/o]nt(i)*: Hitt. *ašanzi* 'they are', *arnuwanzi* 'they bring', cf. Luw. 3pl. *armaminti*, Ved. *yuñjánti* 'they bind', *ṛṇvánti* 'they move', Gk. *tínousi* 'they pay', Lat. *sunt, ferunt* 'they carry', OCS *berqtŭ*.

Skt. *āsan* 'they were' (< **a-asant*), Gk. *hēen* (< **e-es-ent*), Avest. *gəman* 'they came', Toch. B *kamem*, Luw. *nakkuššaunta* 'they replaced'.

In the *-Ha series we find -r: Lat. perfect 3pl. *fēcēre* 'they made', *fuēre* 'they were', *cēpēre* 'they took'; Hitt. *akir* 'they died, were killed' (BoTU 17 A, Rs. 38), *arir* 'they reached, attained' (KUB XXVI 101 II 4), *ašešir* 'they settled' (HAB, BoTU 22 A I 11, 12 A II 25, 26), *ti-i-e-er* 'they put' (Tel., BoTU 23 A I 21), Skt. perf. *dadhúh* 'they put', cf. *ā-dh-ur* id.

In Hittite (unlike Luwian) the 3pl. ending -er of the *-Ha series extends also to the preterites of the *-mi conjugation, displacing the original *-ant-: *ešer* 'they were', *eter* 'they ate' beside Luw. 3pl. pret. *nakkuššaunta* 'they replaced'.

A paradigmatic leveling that disrupts the original distribution occurs in Sanskrit: in most verb forms, except for the thematic type, the secondary ending is replaced by -uḥ < -ur (Thumb and Hauschild 1959:II.204, § 427, IIb; Watkins 1969: § 21, 42).

The first- and second-person plural endings in both the *-m(i) and *-Ha paradigms can be brought together in the reconstructions *-me- and *-the-, with numerous variants among the historical dialects. The forms for 'be' are:

	Hittite	Sanskrit	Ionic Greek	Latin	Old Church Slavic
1pl.	<i>eš-wen(i)</i>	<i>s-más(i)</i>	<i>ei-mén</i>	<i>su-mus</i>	<i>jesmŭ</i>
2pl.	<i>eš-ten(i)</i>	<i>s-thá(na)</i>	<i>es-té</i>	<i>es-tis</i>	<i>jeste</i>
3pl.	<i>aš-anzi</i>	<i>s-ánti</i>	<i>entí</i> (Dor.)	<i>s-unt</i>	<i>sqtŭ</i>

The endings *-me- and *-the- are clearly related to the pronominals in *-m- (first person) and *-th- (second person), which shows that the verbal endings are pronominal in origin. In Hittite, in addition to the 1pl. ending -wen(i) we also find -men(i) in the same function: *arnumeni* 'we bring', *pi-e-tu-me-ni* (KBo XVII 1 32 (1), II 29 (6), 43 (1)), *tu-me-e-ni* 'we take' (KBo XVIII 1 III 44, IV 25, KUB XIII 35 IV 6, KUB XVII 8 IV 17, 22, cf. *daweni*, KUB XVI 16 II 20, *dawani* KUB XII 63 II 3), *wa-aḥ-nu-me-ni* (KBo XVII 1 II 35).

48. Interesting in this regard is the Hittite finite 3pl. verb form in *-nthi > -nzi and the predicative -nt- participle from the verb *ak-* 'die, perish', which are evidence of the typological plausibility of a historical connection of such structures. Cf. *li-e ak-kán-zi* 'may they not die', 'may they not be killed' (KBo III 23 I 8') and 2 DUMUMES *ak-kán-te-eš* 'two sons died' (Pud. I 24(4)); singular *akkanza* 'having died' in the sense 'dies, will die' (Kammenhuber 1973-:1, *ak-*, 26-32).

Since these verbal endings are of pronominal origin, the parallel Hittite formatives *-wen*, *-men* might possibly be interpreted as reflexes of pronominal forms: the first-person inclusive **-we-* and the exclusive **-me-* (see 5.4.1 above); cf. Watkins 1969:46-48.

In Hittite these endings, once functionally differentiated, were redistributed according to phonetic factors, so that synchronically they are phonetically conditioned variants of a single first-person plural morpheme: *-m-* followed stems ending in *-u-*, and *-w-* occurred elsewhere (Sturtevant 1942). Evidence for an original functional distribution can be seen only in a few verbs of the *-hi* conjugation (see Dressler 1968).

5.5.6. *Derivational means for indicating plurality of an argument in the verb: reduplication, *-šḱh-*

The plural verb endings which go back to first- and second-person pronouns and the old markers of active and inactive deverbal nouns are relatively late formations for expressing plurality of an active or inactive argument. This inflectional marking of plurality with a suffixed verbal marker must have been preceded by derivational modification of the verb stem; evidence for this can be found in a number of historical Indo-European dialects, and especially the oldest ones, the Anatolian languages. The rudimentary nature of the derivation mentioned is an additional argument for its age. This verbal marking of plurality is typologically synchronous with the stage of Indo-European where plurality of the noun referent was not morphologically marked on the noun itself.⁴⁹

One of the important ways of indicating a plural argument on the verb derivationally was, to judge from Anatolian relic data, reduplication of the initial consonant; this produced verb stems formally identical with those that later emerged as perfects. The reduplicated stem generally marks plurality of what is historically an inactive argument of a one-place verb (the subject of an intransitive verb in Hittite) or the structural inactive with a two-place verb (direct object of a transitive verb in Hittite). This shows that this means of marking plurality is functionally archaic, oriented toward what was historically the inactive argument of a one- or two-place verb:

Hitt. IZKIMḪI.A ḪULḪI.A *kikkištari* 'bad omens will be fulfilled' (IBoT I 331f.).

n-aš-šan katta damedas A.NA GALḪI.A *lelḫuwai* 'and he will pour (wine) into other cups' (ABoT 7 V 8f.); cf. in the same text *nu-ššan* A.NA GAL

49. Also worth mention is the long-noted fact that Indo-European had *pluralia tantum* verbs (Meyer 1909, q.v. for typological comparison with Ubykh); see Knobloch 1955:214-15, where it is proposed that there were singulative derivatives in *-k-* of the aorists of *tīthēmi*, *dīdōmi*, *hēmi* (cf. Knobloch 1951a).

LUGAL *lahuwai* ‘and he pours into the king’s cup’.

nu-war-aš-ta EGIR-pa kuit wewakkinun ‘and since I asked them back to you’ (AM, KBo III 4 II 10f.); cf. *nu A.NA ABI.YA DUMU.ŠU LUGAL-uiznanni anku wekir* ‘and they asked the father for his son for ruling’ (Pestgebet, II § 4).

nu GIŠwaršaman maḥḥan lukkanzi našta anda 4-taš ḥalḥaltumariaš lalukkišzi DMAḥ-ni-ya-kan A.NA ZI.KA karateš-teš-a anda QA.TAM.MA lalukkišdu ‘and as they burn brushwood (*lukkanzi*) and as it throws light (*lalukkišzi*) in four directions, so may the Mother Goddess shed light (*lalukkišdu*) on your life and your internal organs’ (KUB XXXIII 51 5-7).

ḥuwappaš-a-kan LÚMEŠ-uš GIŠ-ru man lilakki ‘and evil people he bends like a tree’ (KUB XXIV 8 I 3).

10 MÁŠ.GAL *nanniyanzi* ... ‘and they lead ten goats’ (KUB XI 23 V 16).

na-aš-ta ŠA KUR URUA-aš-šu-wa 2 SIG₇ ERÍNMEŠ Û 6 ME LÚMEŠ iš-me-ri-ya-aš ENMEŠ-uš ta-at-ra-aḥ-ḥa-aš ‘and he called to rebellion 10,000 warriors and 600 charioteers of the country of Assuwa’ (KUB XXIII 11 III 5-6), cf. *tarḥ-* ‘defeat, force’.

Especially significant in this connection are Old Hittite forms with passive meaning: 2 LÚMEŠ *ḥulḥuliyanteš* ‘two persons are slain (dead)’ (BoTU 14 12; van Brock 1964:135); *nu URUDIDLI.ḪIA GAL.GAL.TIM tittiyanteš ešir* ‘and large cities were founded’ (or ‘united’?) (*Tel.*, 2BoTU 23 B I 12).

That the object was plural is especially clear in cuneiform and hieroglyphic Luwian: *lalaiddu-tta papraddu-tta IV-ti partati* ‘may he take, may he drive off in four directions’ (KUB XXXV 43 II 12); cf. *a-du-tta ipalatin latta* ‘and he took the left side from him’, i.e. took everything bad (*ibid.*, IV 16-17); cf. also *elēḥa-* with multiple object beside *elḥa-* with single object in KUB XXXV 21 V 30.

Cf. also Luw. *mammanna-* ‘say, talk’ (many words) vs. *mana-* ‘pronounce’ (one word): van Brock 1964:137.

In Hittite a form in *-šk-* also functions to mark plurality of a subject or object argument. It forms what appears to be a new stem, distinct from the singular one without *-šk-*:

OHitt. *nu DUMUMEŠ.ŠU an-da-an zi-ki-e-et* ‘and she put her sons inside (the pots)’ (KBo XXII 2, Vs. A 3; tale of the city Zalpa and the children of the queen of Kanes).

Hitt. *lingauš šarriškir* ‘they broke the oaths’ (KBo IV 4 I 46, II 9); cf. *lingain šarrier* ‘they broke the oath’ (KBo II 5 IV 13).

KUR-*e-kán an-da ak-ki-iš-ki-it-ta-ri* ‘in the country very many die’ (KUB IX 31 II 40, HT 1 II 15f.).

ma-a-an-kán ŠA KARAŠḪI.A UG₆-an ki-ša-ri UNMEŠ-tar ANŠE.KUR.RAḪI.A GUDḪI.A KAL.GA-za ak-kiš-ki-ta-ri ‘when among the army the plague flares up (and) people, horses, and bulls die in great numbers

(strongly)' (Dressler 1968:162, 180-82, §§ 30-32; for Lithuanian see *ibid.* 61; Kammenhuber 1973-:1, *ak(u)*, 20).

The same morphological indicators of a plural argument on the verb also mark aspectual oppositions: Hitt. *-šk-* functions both in the aspectual meaning of iterative (Bechtel 1936) and as marker of a plural argument. This functional and morphological correlation can be compared to the properties of active languages, in which the verb shows aspectual, and not tense, oppositions (cf. Dressler 1968).

5.6. The active typology of Proto-Indo-European

5.6.1. Structural implications of the active type in Proto-Indo-European

The comparative and internal reconstruction of earliest Indo-European structures given above makes it possible to posit for earliest Indo-European a binary system of noun classes, defined as active and inactive depending on the nature of their referents. The stative/active bifurcation of nouns implies that the language had a number of structural features which are directly linked to binary noun classification.

The first such feature is the binarism in the morphological marking of nouns with **-os* (for stems belonging to the active class) and **-om*, **-Ø* (inactive), which in turn motivates the lack of distinctions in the noun paradigms, particularly the inactive paradigm. Syntactic relations are basically marked by two case formatives, **-[o]s* and **-[o]m*, *-Ø*, which actually go back to derivational devices. The other case forms (the later dative and locative cases) are secondary developments which arose from adverbial formations which had earlier been used as circumstantials with verbs.

A binary noun classification implies a division of verbs into active and inactive subclasses, with semantic properties determined by the nature of the referents of active and inactive noun classes respectively. The entire ancient verbal system of Indo-European, which displayed structural binarism in having two verbal conjugations, **-m(i)* and **-Ha*, lexicalization of verbs for combination with active or inactive nouns, an originally impersonal **-Ha* conjugation, and similar features, is motivated by the binary active/inactive structural system for nouns.

The binarism of the verb system is determined by the binarism of the nominals. Thus the dominant semantic principle of a linguistic system of this type is the active/inactive division of nouns based on the semantics of their referents. The binarism of nominals is also responsible for the presence of distinct constructions for verbs of affect, the existence of special possessive constructions and absence of a verb 'have', the inclusive/exclusive category in the pro-

nominal system, etc.

All of these structural properties are reconstructible for Proto-Indo-European in its earliest period and give grounds for considering Proto-Indo-European of that time an active language, one oriented toward a binary noun classification based on the active/inactive opposition and displaying all the consequent structural implications in its linguistic system. Thus the reconstructed Proto-Indo-European linguistic system of the earliest period is to be classified as of the active type.⁵⁰

5.6.2. A general typological characterization of active languages

The basic characteristic of the active language type affecting its morphological and syntactic structure is the formal opposition of active and inactive noun classes. This principle determines the formal treatment of the argument of a one-place verb as active or inactive:

- (1) V + A
 V + In

With two-place verbs the agent argument naturally takes the marker of the active class; the other argument expresses the patient (i.e. the argument the verbal action is directed at) and is formally treated as a noun of the inactive class (regardless of whether it lexically belongs to the active or inactive class):

- (2) V + In* + A⁵¹

Slightly modifying the notation of Sapir 1917-1920 and Fillmore 1968:54, the sentence structures for the active type can be presented as follows:

- (3) V + A
(4) V + In* + A
(5) V + In

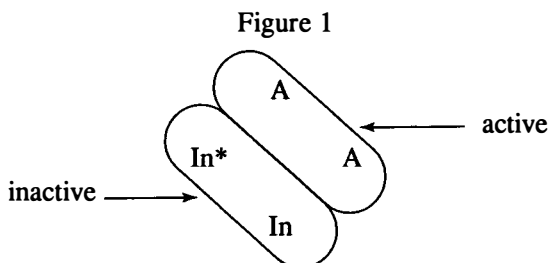
By removing the symbol V we obtain the nominal forms for the three structural types of sentence:

50. This claim was apparently first noted in Kacnel'son 1947, 1967 and first formulated explicitly, with a definition of the structure of the active type, in Klimov 1973, 1973a, 1974, 1977. Some of these features have long been noted for Proto-Indo-European, but associated with ergativity: Uhlenbeck 1901, 1937, 1950, Schuchardt 1950a, b, van Wijk 1902, Pedersen 1905:152-54, 1938:83-85, Vaillant 1936, Hendriksen 1940; cf. Kacnel'son 1936, Savčenko 1967.

51. *In** in (2) stands for both lexical and structural-syntactic inactive.

- (6) A
 (7) In* A
 (8) In

In all three types the case forms of the *A* element and the *In* element coincide formally, as shown in Fig. 1:



Examples of the active type are a number of Amerindian languages in which an active/inactive dichotomy in nouns is one of the basic structural characteristics. Specifically, this type is found in languages of the Na-Dene, Siouan (Sapir 1958), Athabaskan, and Tupi-Guaraní families and others.

A basic structural characteristic of these languages is a classification of the nouns into active and inactive based on whether their referents have a life cycle. The active class in these languages includes names of people, animals, trees, and plants; the inactive includes all other objects (in Navajo, *tó* 'water', *yas* 'snow', *tsé* 'stone', *tsin* 'stick', etc.): Hoijer 1951, Hoijer and Joel 1963.

The noun dichotomy implies a binary classification of verbs based on whether the action or situation designated is inactive or active. Active verbs include various actions, motions, and states typical of active nouns, while the inactive verbs include states and qualities ascribed to inactive nouns.

Another characteristic of these languages is the presence of a distinct structural group of verbs of affect (Pinnow 1964:84-85).

One of the most characteristic lexical traits of these languages is verbal doublets where the paired verbs are close in meaning and each combines with only active or only inactive nouns (for Navajo examples see note 33 above).

Also motivated by the binary noun classification is the existence of an inclusive/exclusive category in the pronominal system.

Also typical is the lack of a verb 'have'; possessive relations are expressed in these languages by descriptive constructions with 'be', e.g. Navajo *n-tcij xóló* 'you have firewood', lit. 'your firewood is' (Reichardt 1951:362-63). Possession is expressed with distinct forms for alienable and inalienable possession (see Sapir and Swadesh 1950:105).

The nominal morphology of active languages is very weakly developed. In particular, the category of number is weakly represented in nominals, found only in certain groups of nouns, primarily those of the active (or animate) class. Plurality of an argument is primarily marked on the verb: e.g. Quileute *t'ciciqa* 'they were dead' (from *t'ciqa* 'die', cf. Hitt. *akkiškittari* above), *kwe.'kutsa* 'many are hungry' (reduplication of *kwe.'tsa* 'he is hungry'), etc.: Andrade 1911:191, Dressler 1968:66-67. In a number of these languages, the marking of plurality leads to suppletive verb forms for singular and plural.

In active languages, the declension system is reduced to a binary opposition of two basic cases, active and inactive. For example, in the Gulf languages there is an opposition of active case in *-t* to inactive in *-n/-Ø* (Speck 1907:481). The active case marks an active argument, the *-n/-Ø* case an inactive argument functioning as subject of a one-place verb or patient of a two-place verb.

The verb systems of active Amerindian languages distinguish two series of personal affixes, active and inactive, which index the active and inactive arguments in a syntactic construction.

5.6.3. *The shift of the Pre-Indo-European active type to nominative-accusative as the result of changes in deep structure*

The linguistic structures surveyed above which are implied by an active/inactive noun dichotomy give typological plausibility to the structures reconstructed for Proto-Indo-European, namely the ancient noun classification into active and inactive and the structural consequences of that classification.

A number of structural features of the historical Indo-European languages become comprehensible when traced to an early Proto-Indo-European system with a structural-semantic active/inactive dichotomy in nouns and the active/inactive verb dichotomy it implies. Only with later structural transformations of the original type does the Indo-European system directly continued by the historical languages arise.

A language of the active type is oriented not toward subject-object relations but toward relations among active and inactive arguments. The dominant semantic principle of such a language is a binary nominal classification (active vs. inactive), which in effect determines the entire structure of the language — declension and conjugation. The morphological and syntactic potential of the verb depends on the binary classification of nouns. The binary noun classification is fundamental to the deep structure of an active language and determines the entire complex of structural traits manifested in the surface structure.

Therefore it is natural that structural shifts affecting the deep structure of the language, specifically the dichotomous classification of nouns, should trigger shifts of a number of features implied by the noun classification and appearing

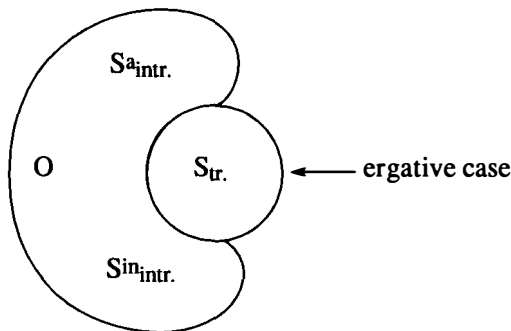
in surface structure. Such a shift of the active deep structure must have occurred at some stage in the development of Proto-Indo-European. It involved a transfer of the dominant classification from the noun to the verb, which began to show structural distinctions based on the binary principle of transitive vs. intransitive. Transitivity became the determining classificatory principle, a principle implying a number of surface-structure characteristics. The central opposition shifted from the noun to the verb.

This was a shift from more concrete (nominal) to more abstract (verbal), from oppositions of concrete denotata to oppositions of *types* of action and activity. The opposition of transitive to intransitive types of verbal action directly entailed the appearance of subject-object relations, expressed by the arguments which functioned as subject or object of the action.

5.6.4. Ergativity and accusativity as surface grammatical variants of identical deep-structure relations. Transitivity and intransitivity as the semantic basis of ergative and accusative languages

The verb classification based on transitivity and the rise of subject-object relations replacing the activity opposition entailed fundamental changes in surface structure. The linguistic type oriented toward subject-object relations implies a formal case opposition of subject and object cases in surface structure. When the subject case is the marked one in constructions with a transitive verb, the structure known as ergative results. It can be represented as in Figure 2:

Figure 2



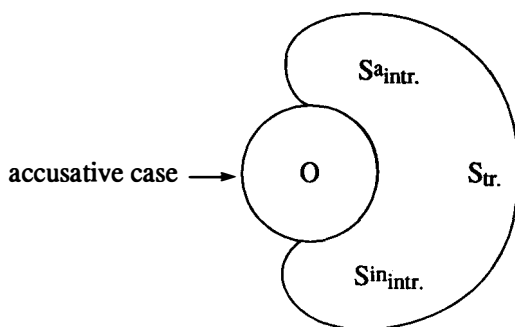
$S^a_{intr.}$ stands for the subject of an intransitive verb reflecting a noun of original active meaning; $S^{in}_{intr.}$ stands for the intransitive subject reflecting a noun of original inactive meaning.

The distinction of semantically active vs. inactive subjects with intransitive verbs no longer plays any role in an ergative language; it is retained in Figure 2

only to show the relation between active and ergative types. The essential factor in Figure 2 is the formal identity of the subject of intransitive verbs and the object of transitives, and their formal opposition to the specially marked subject in a transitive construction.

When the marked case in a construction with a transitive verb is the object case, the result is the structure known as accusative (the 'nominative construction' in traditional terminology). It can be represented as in Figure 3:

Figure 3



What is essential here is the formal identity of the subject of transitive and intransitive verbs, and the marked nature of the object of transitive verbs.

The ergative and accusative (nominative) types form a single typological class, for which the essential thing is the presence of subject-object relations in deep structure and the transitivity opposition in verbs (see Schmidt 1973). This class contrasts with the active type, whose structural determinant is the active vs. inactive dichotomy in nouns. Hence the difference between the ergative and accusative types pertains only to surface structure, having to do with different markedness of subject and object distinctions. The two types are identical at the level of deep-structure relations, which are based on the transitivity of the action and the resultant subject-object correlations. Ergativity and accusativity are two distinct surface-structure expressions of the same deep relations. Therefore to claim that in the transition from ergative to accusative or vice versa something essential changes in the language would be unjustified from the viewpoint of the structural determinants of language. The only change is in the surface structures expressing the deep subject-object relations; the deep relations remain invariant through such surface-structure transformations (cf. Kuryłowicz 1946; for a critique of the term *ergativity*, cf. Wilbur 1970).

5.6.5. *A typology of structural transformations of active languages*

Structural shifts which affect deep syntactic relations do not occur when there is

a transition from ergative to accusative or vice versa (as in the modern Indo-Aryan and Iranian languages: Pirejko 1968; also Elizarenkova 1967, Regamey 1954, Allen 1950), but rather when the active structure becomes ergative or accusative. Such a change entails essential shifts at the content plane, with deep-structure consequences (the rise of the transitive/intransitive opposition of actions in place of the active/inactive, and the rise of subject-object relations) and the corresponding reflexes in surface structure (the appearance of new syntactic and morphological structures, the preservation of a few old structures, unmotivated by the new relations and preserved as relics of the old active/inactive correlations).

The new subject-object relations in deep structure can take the surface form of either the ergative or the accusative type. The replacement of the binary active/inactive noun classification by verbal transitivity and the rise of deep subject-object relations must have begun at the early stages of Proto-Indo-European, since Indo-European at the period of the breakup can be reconstructed as an essentially accusative language with a few obvious structural traces of the active type.

The breakdown of the active/inactive dichotomy in nouns and the rise of the transitivity opposition in verbs brings about the rise of subject-object relations and triggers the functional identification of the originally inactive argument of a one-place verb with the historically active argument of one-place (intransitive) and two-place (transitive) verbs. Thus the inactive argument of a one-place intransitive verb is syntactically opposed to the former structural inactive with two-place verbs, which becomes the case (accusative) of the direct object of a transitive verb. From the Proto-Indo-European active type shown in Figure 4 we get the typical morphosyntactic structure of the accusative type, shown in Figure 5.

Figure 4

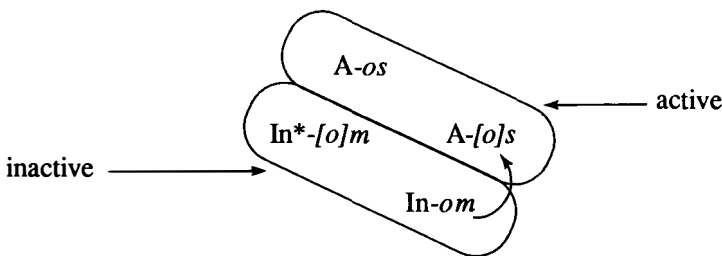
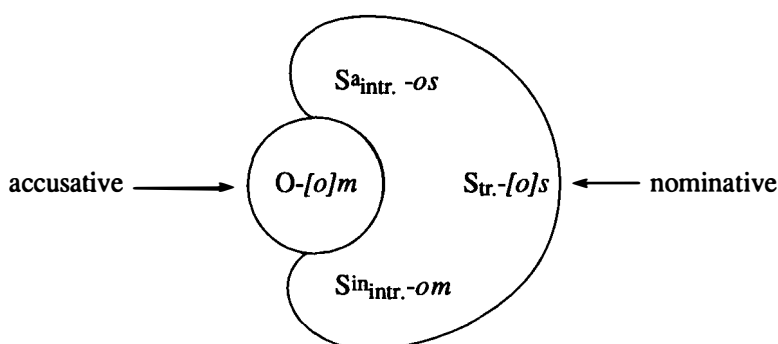


Figure 5



When the full paradigm of the **-Ha* conjugation arose (under the influence of two-place verbal constructions) from impersonal constructions with semantically inactive arguments, the original function of the **-Ha* conjugation was of course disrupted and active nominals in **-os* began to appear in constructions with this conjugation. This in turn changed the **-Ha* verb series into a special conjugation type independent of the class membership of its nominal argument. This situation already obtains in Hittite, with its two formal conjugation types in *-mi* and *-hi*.⁵²

On the other hand, etymologically inactive nouns in **-om/-Ø* entered into the verbal construction type in **-m(i)* once the original opposition of active to inactive nouns no longer had functional semantic significance. Neutralization of the opposition of **-os* and **-om/-Ø* nouns occurred, and they could both appear as subject arguments of one-place verbs of either the **-mi* or the **-Ha* series.⁵³

The old active and inactive cases found on arguments of one-place verbs were neutralized and fell together in a general subject case which was opposed to the structural-semantic inactive in two-place constructions; the inactive thereby became the object case. The subject case — the traditional nominative — was thus opposed in the declension system to a direct-object case, the genitive-accusative. At this stage a system took shape which had a strict subject-object opposition and the corresponding formal marking of these relations. The result

52. For instance, by the time of Old and Middle Hittite texts the *-hi*-conjugation verb *ar-* 'come' can take nouns of common gender: *ták-ku LÜ-aš EL.LUM GEME-aš-ša ši-e-li-eš na-at an-da a-ra-an-zi* 'if there are a free man and a slave woman and they come...' (Hittite Laws, § 31, KBo VI 3 II 61); *ma-a-an 1Tu-ut-ḫa-li-ya-aš LUGAL (GAL) URUḫa-at-tu-ši a-ar-ḫu-un* 'when I, Tudhaliyas, the great king, came to Hattusa' (KUB XXIII II VI 12), etc. *Ar-* also takes neuter nouns (in the third person singular), especially in impersonal constructions, which shows that this verb was earlier used exclusively with inactive nouns: *ku-it-ma-an MU.KAM-za me-e-ḫu-ni a-ri* 'until the year comes to its completion' (Hittite Laws, § 165); *kuedanikki kaš-ti-ari* 'someone becomes hungry', lit. 'for someone it comes to hunger (noun)'.

53. Cf. Hittite constructions such as *watar šeši* 'water will lie'; *nu ú-i-da-a-ar... še-eš-zi* (KBo X 2 II 28); *na-aš-ta ÉMES DEN.LÍL ku-it A.NA URULUM a-ra-aḫ-za e-eš-ta* 'and the temples of Enlil, which were outside of the city' (BoTU 3, 7).

was a single case with the allomorphs $*-os$, $*-om$, and $*-\emptyset$, opposed to an object case in $*-[o]m/-\emptyset$:

The system of subject-object oppositions was:

Subject case		Object case
$*-[o]s$	_____	$*-[o]m$
$*-om$	_____	$*-om$
$*-\emptyset$	_____	$*-\emptyset$

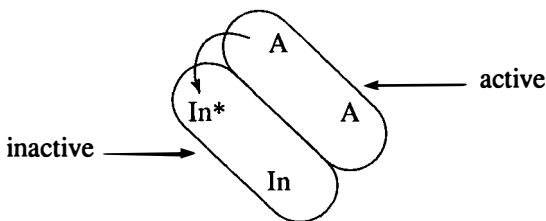
Still another opposition must be distinguished for this system:

$*-\emptyset$ _____ $*-m^{54}$

The paradigm with subject case in $*-\emptyset$ and object case in $*-m$ is the result of phonological change affecting the $*-s$ active case after a sonorant or laryngeal: final $*-s$ was lost, with compensatory lengthening of the preceding vowel: see I.3.1.8 above.⁵⁵

Such changes in the noun system could have produced an ergative system from the original active one. There is no fundamental difference in the paths transforming an active system into an ergative or a nominative one. The only difference lies in the different means used to regroup and mark the original arguments:

Figure 6

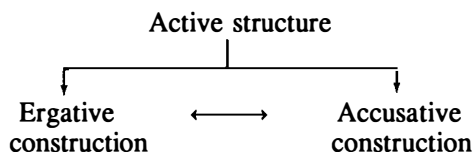


54. Cf. Skt. *dātā* 'giver, donor', acc. *dātāram*, Gk. *dotēr*, acc. *dotēra*, Lat. *dātor*, acc. *datorem*; Skt. *pitā* 'father', acc. *pitāram*, Gk. *patēr*, acc. *patēra*, Lat. *pater*, acc. *patrem*; Skt. *āsvā* 'mare', acc. *āsvām*, Lat. *equa*, acc. *equam*, etc.

55. The sound shift that led to loss of the active marker $*-s$ could have been favored by the rise of a single subject case (opposed to the accusative case of direct objects) and the tendency to have that single subject case be unmarked in opposition to a clearly marked accusative. This tendency of accusative languages is evident throughout the histories of the individual Indo-European languages (Martinet 1956: 13-16); cf. the history of the Slavic cases, where after the reduced vowels were lost in forms like $*domū < *t'omos$ 'house' an unmarked nominative arose and was retained, while an ending $-a$ was innovated for the marked accusative of animate nouns (Meillet 1934 [1951: § 439, 306]). It is the obligatory markedness of the accusative case, in contrast to the nominative, that justifies calling this morphosyntactic type 'accusative'.

Consequently, the correlations among active, ergative, and accusative types can be schematically represented as a dependency tree where both ergative and accusative are derived from the active type and the ergative structure can change into accusative and vice versa:⁵⁶

Figure 7



The linguistic structure of Kartvelian, which shows clear evidence of an original active nature that has been surveyed in detail by Klimov (1973; also 1973a, 1974), was reorganized at the time of its breakup into an ergative language with morphological and lexical marking of transitive and intransitive verbs and a nominal paradigm with a distinct ergative case and a single case for subjects of intransitive verbs and direct objects of transitives. Ergativity appears in the past-tense verbal paradigm (as in Indo-Iranian), while in the present tense the case of the transitive subject is identical to that of the intransitive subject and the direct object is in the dative (Čikobava 1948). The inconsistent ergativity of the Kartvelian linguistic structure brings it even closer to the accusative type and shows that the two are variant surface expressions of the same deep structures. Thus the late Indo-European accusative structure and the late Kartvelian ergative structure are different surface manifestations of homologous transformations that affected the deep structures of Proto-Kartvelian and Proto-Indo-European.

Interestingly, in several contemporary Kartvelian dialects there have been shifts away from the Proto-Kartvelian inconsistent ergative structure to accusative (in Mingrelian) or consistent ergative (Laz): Klimov 1967:154.

On this view of the accusative and ergative types, it becomes clear that claims for evidence of 'ergativity' in Indo-European (Uhlenbeck 1901, 1950a:101-2, 1950b:97; Vaillant 1936, Hendriksen 1940, Martinet 1956, Savčenko 1967) are unfounded. The fact that Indo-European has a formal accusative as direct-object case opposed to a single subject case for transitive and intransitive verbs is sufficient evidence for denying ergativity in Indo-European structures (see Desnickaja 1947, 1951). Late Indo-European is a typical accusative language, although it preserves relic traits of an unambiguously active type. That type can be reconstructed for early Pre-Indo-European by comparative and internal reconstruction based on the nominal and verbal structures of the historical Indo-European dialects.

56. In his later study, Klimov (1977:304ff.) comes to an analogous conclusion concerning the relation of the active to ergative and accusative types; but see Klimov 1973, where the ergative structure is seen as an intermediate stage in the shift from active to accusative.

Chapter Six

The grammatical syntagmatics of Proto-Indo-European in typological perspective

6.1. The syntactic structure of the sentence core in Indo-European

6.1.1. A reconstruction of SOV order and its reflex in the historical Indo-European dialects

The word order in a two-place sentence core in Proto-Indo-European at its earliest, active, stage may be rendered as:¹

A — In* — V

This same Proto-Indo-European word order was preserved in Common Indo-European when it shifted to the accusative type and subject-object relations arose. The sentence core of accusative Indo-European can be represented schematically as:

S — O — V

This word order can be reconstructed from the syntactic data of many ancient Indo-European dialects.

By the end of the last century Delbrück, analyzing the early Indo-European texts known at that time (Vedic, Latin, etc.), had established that the verb was typically put at the end of the sentence. In other words, these ancient Indo-European dialects show an OV structure for the simple declarative clause.²

For Indo-Iranian, OV order can be reconstructed in a number of formulas that are identically reflected in Vedic and Avestan: **kśatram *wan-* 'attain power': Ved. *kṣatrām ... vanatām* (RV I, 162, 22), Avest. *xšaθrəm ... vanaēmā* (Y 31,4); **ṛtam *dhā-* 'establish truth (order)': Ved. *ṛtām dadhā* (RV VIII, 27,

1. Verb-final ordering of clause elements is typical of active languages, e.g. Kamayura *wararuwijawa moja o-u'u* 'the dog bit the snake', Hidatsa *wacêo wii-ta-sûka ikaoc* 'the man saw our dog' (Speck 1907:475, Li 1946:413-15, Landar 1961:175-77, Matthews 1965:41, 47, 55, 145, Klimov 1973:218-19). Of interest is the survey of purely ergative languages of Schwartz 1972, who finds that SVO order is impossible and SOV is possible (in several Australian and Amerindian languages).

2. In the notations SOV and SVO, S can be left out as an invariant element found in a particular position (initial position).

19), Avest. *ašəm* ... *daduyē* (Y 46, 15); **ṛtam* **dhar-* 'maintain (establish) truth': Ved. *ṛténa ṛtám dharúṇam dhārayanta* (RV V, 15, 2), Avest. *ašəm dərəidyāi* (Y 43, 1); cf. **sthūnām* **dhar-* 'maintain support': Ved. *sthūṇām ... dhārayantu* (RV X, 18, 13), Avest. *stunā vīdārayeiti* (Yt 10, 28); **ṛtam* **sap-* 'maintain truth': Ved. *ṛtám sapāmi* 'the truth I maintain' (RV V, 12, 2), Avest. *ašəm ... haptī* (Y 31, 22); **waḡram* *ghar-* 'throw the club (god's cudgel)': Ved. *vájram ā jigharti* 'he throws the cudgel', Avest. *vazračiṭ ... niyṛāire* (Y 10, 40); **waḡram* **sik-* 'cast a cudgel (from metal)': Ved. *vájram ... ásiñcata* (AV 11.10, 12, 13), Avest. *vazrəm ... frahixtəm* (Yt 10, 96; Mayrhofer 1976:III.127); *(a)*idhmam* **bhar-* 'carry fuel': Ved. *idhmám jabhárat* (RV IV, 2, 6), Avest. *aēsməm ... bərətəm* (Y 62, 9); **kamam* **i-* 'go against wishes': Ved. *kāmam étyāsme* (RV X, 66, 14), Avest. *kāmahyā ... yām itē*; **mantram* **taks-* 'make ('hew') an incantation': Ved. *mántram ... átakṣan* (RV VII, 7, 6), Avest. *mənθrəm tašaṭ* (Y 29, 7); **tawisīm* **dhā-* 'apply bodily force': Ved. *táviṣīm dádhdhānaḥ* (RV I, 35, 4), Avest. *təvišīm dasvā* (Y 33, 12); **wṛtram* **tar-* 'overcome (defeat) opposition': Ved. *vṛtrám tar-* (RV VII, 48, 2), Avest. *vərəθrəm tar-* (Yt 13, 38; Schmitt 1967: § 382); cf. **wikwa-* **dwais-ā* ... **tar-* 'overcome (defeat) all enemies': Ved. *vísṣvā dvéṣāṇsi tarati* (RV IX, 111, 1), Avest. *taurvayeinūm vīspā ībaēšā* (Yt 10, 34).

Analogous constructions with **the/orH-* 'defeat, conquer' and the object preceding the verb can be reconstructed for Proto-Indo-European as well, specifically for texts of the Myth of the Snake-fighter: Hitt. *nu-za MUŠII-lu-ya-an-ka-aš* DIM-*an tar-aḫ-ta* 'and he defeated the dragon of the storm god' (KBo III 7 I 11); *na-an-za nam-ma MUŠII-lu-ya-an-ka-a[n] tar-aḫ-ḫu-u-wa-an da-a-iš* (ibid. III 24) 'and then he began to defeat him, the dragon' (for the verb *tarḫ-* in these constructions see Ivanov and Toporov 1974:134). The same correspondence occurs in formulas with final Indo-Iranian *(*par-*) *nai*, Hittite (*para*) *nai-* 'lead': Ved. *páry áśvaṁ náyanti* '(they) lead the horse' (RV I, 162, 4), Avest. *aspa para ... nayente* (Yt 10, 42), cf. Hitt. *na-šta IKišnapilin ERÍNMEŠ ANŠE.KUR.RAḪI.A A.NA IAttariššiya menaḫḫanta zaḫḫiya para naiš* 'he (the king) sent Kisnapilis with the infantry and cavalry (chariots) to battle with Attarissiyas' (KUB XIV I, Vs. 61).

The same OV order is attested in Proto-Indo-European *figurae etymologicae* such as Indo-Iran. **subhṛtam* **bhar-* 'bring reward' (= 'good gift'): Ved. *súbhṛtam bibhárti* (RV IV, 50, 7), Avest. *hubəratəm barāt* (Yt 15, 40); **yaḡnam* **yaḡ-* 'perform sacrifice': Ved. *yajnáṁ ayajanta* (RV I, 164, 50); **saumam* **su-* 'press out soma': Ved. *sómam ... sunoti* (RV I, 109, 4).

In the Germanic languages there is also evidence for final position of the verb (McKnight 1897, Hopper 1975) in the most archaic poetry, although in the texts surviving in written form this position is no longer statistically dominant (Werth 1970); there are, however, revealing runic examples such as *ek HlewagastiR HoltijaR horna tawido* 'I, Hlewagastiz of Holtijaz, made a horn'

(with weakening of accent in the final verb: Lehmann 1956:77). In Old Germanic poetry (as in the runic line), the verb is most often in final (fourth) position in the line and hence does not take part in alliteration (Sievers 1893:44, Lehmann 1956:74, 1958:5; see now also Yoshida 1982).

Hittite generally shows the same pattern for the sentence core. The unmarked sentential word order has the verb in final position: OHitt. LUGAL-*uš* 3-*iš* GUD-un 1 *ši-i-na-an-na al-la-ap-pa-aḫ-ḫi* SAL.LUGAL-*aš-ša-an* 3-*iš* *al-la-ap-pa-aḫ-ḫi* (KBo XVII.1+1 4'-6') 'the king spits three times on the bull and the icon, and the queen spits on it three times'; NINDA-an *e-ez-za-aš-ši wa-a-tar-ra e-ku-uš-ši* 'bread you will eat and water you will drink' (HAB, BoTU 8 III 29); *ú-uk ku-in ḫar-mi* 'whom I hold' (KBo XVII I+III 28); *ša-an at-ta-aš-mi-iš* ¹Ki-*z-zu-wa-an na-at-ta ḫu-uš-nu-ut* (BoTU 10 γ, 18) 'and him, Kizzuwas, my father did not leave alive'; EGIR-an-*da-ma-kán* ¹RMES.ŠU LÚMES GAL.GAL *ud-da-a-ar-še-et ḫu-ur-tal-le-e-er* (HAB, BoTU III 43) 'and then his servants and important people destroyed his word'; *nu ḪUL-lu ut-t(ar i-e-e)r nu-k[án]* ¹Mur-*ši-li-in ku(en-nir) [(nu)] e-eš-ḫar i-e-er* (Tel., 2 BoTU 23 A I 33) 'and they did an evil deed and killed Mursilis and shed his blood'; *še* EGIR-*pa A.NA* ¹NA.RA.AM-¹DSIN-na EN(?)*-aš-ši ḫa-lu-kán pí-e-te-ir* (BoTU 4 A+II 14) 'and they brought back the message to Lord (?) Naram-Sin'; *nu-za ŠA A.BI.ŠU* [*e-eš-ḫar* EG]IR-an *ša-an-aḫ-ta* (2BoTU 20 II 10) 'and they demanded their father's blood back' (i.e. they wanted vengeance for the murder of their father); ¹GIŠTUKULḪI.A-*uš-šu-uš-ta* ZAG.LU-*za da-aḫ-ḫu-un* 'I took the weapons from their shoulders' (Tel., BoTU 23 A II 30); *nu* ¹Te-li-*pí-nu-uš URUḪa-at-tu-ši tu-li-ya-an ḫal-zi-iḫ-ḫu-un* (Tel., BoTU 23 A II 34) 'and I, Telepinus, called a meeting in Hattusas'; LUGAL-*uš* 3-¹ŠU *a-i-iš-še-et a-ar-ri* (KBo XVII 1+I 15) 'the king washes his mouth three times'.

The same ordering of the verb and object can be established for Ancient Greek (Houben 1977), Tocharian (Zimmer 1976), and Celtic (Schmidt 1980:188ff.).

In summary, syntactic analysis of the sentence core in the early Indo-European dialects makes it possible to establish a sentence pattern where SOV is the unmarked order (Delbrück 1888, 1893-1900; Watkins 1962, 1963a; Lehmann 1972a, b, 1973a, 1974:39ff.; Dressler 1971).³

3. For the early Indo-European dialects there is also verb-initial word order in a number of instances. Verb-initial sentences as a rule represent various modality and status transformations of the core of a simple narrative sentence, or contextually conditioned transformations (Ivanov 1965:259, Dressler 1969, Werth 1970, Watkins 1962a, 1963a, 1968-1969). These bring about inversion of the unmarked order, so that the verb becomes sentence-initial (cf. also Hopper 1975, Zimmer 1976).

In particular, verb-initial sentences in Hittite often have the particle *-ma* 'but', 'after all' or the negative *natta* (= *UL*) in final position. This shows that such sentences are emphatic transformations of the simple sentence: OHitt. *akiš-ma-aš* 'but he died!' (2 BoTU 12 A II 12, Palace chronicle), *šakruwanzi-ma-aš UL* 'but they do not drink them' (Ivanov 1965:257); *datta-ma-at* 'but after all he took this' (Ras Shamra 17, 109, recto 4; Schuler 1971:228, Haase 1971:71).

Examples of contextually conditioned inversion, i.e. a transformation triggered by the

Because of its final position in the sentence the verb was unaccented; this is because the general intonation contour for the Indo-European sentence apparently had a sharp drop toward the end of the sentence (see Lehmann 1974:51). The verb was accented only if it was moved to a marked position at the beginning of the sentence, a position coinciding with the highest point of the intonation contour.

6.1.2. *The structure of compounds in the historical dialects as a reflex of OV order*

The same OV order is shown by compounds consisting of a nominal combined with a verbal:

Skt. *dhana-dā-* 'money-squanderer', *mádhu-pā-* 'wine-drinker', *bhū-pa-* 'earth-defender, country-defender' (= 'king'), *avi-pālā-* 'shepherd' (cf. OArm. *hoviw* < **Howi-paH-*, Gk. *ai-pólos* 'goatherd', *bou-pólos* 'bull-herder', 'herder' in general), *śatru-hán-* 'defeater of enemies', *havi-ád-* 'eater of sacrifice'; *madhv-ád-* 'honey-eater', OCS *medvěďi* 'bear' < 'honey-eater'; Skt. *pathi-kṛt-* 'priest' ('pathmaker', cf. Lat. *ponti-fex*), OCS *čaroději* 'sorcerer', Lat. *arti-fex* 'craftsman', *au-ceps* 'bird-snarer, fowler', *iū-dex* 'law-indicator' = 'judge', *tubi-cen* 'trumpeter', *rēm-ex* 'rower' (*rem-* + *eg-*).

Gk. *khér-nips* 'hand-washer', *boó-kleps* 'bull-stealer', *hippó-damos* 'horse-tamer' (Benveniste 1967, 1974; Jacobi 1897:7ff.), *thanato-phóros* 'death-bringing', *strat-ēgós* 'leader of army, leader', *paido-tróphos* 'child-feeder',

structure of a whole text fragment, are Homeric constructions such as ... *lūsan d'agorēn* (Iliad 1.305) 'broke up the assembly' (following a subordinate clause); ... *bē d'ár' óneiros* (Iliad 2.16) 'Dream came'; *bē d'ár' ep' Atrēidēn* (Iliad 2.18) 'came to the son of Atreus'; *stē d'ár' hupēr kephalēs* (Iliad 2.20) 'he stood above his head'; for other examples see Rosén 1973:317-29. There are sentences of analogous structure in Hittite with the verbs *pai-* 'go' and *uwa-* 'come'. Inversion to VSO order is also observed in Mycenaean (see Risch 1967).

This sentence type, transformed relative to the Proto-Indo-European norm, is generalized in a number of dialects and becomes the unmarked order (Slavic, Albanian, Armenian). But the earlier OV order is still clearly evident in these dialects, in particular Slavic and Greek, in compounds which reflect the original syntactic order. Since the generalization is late, the verb-initial order of the individual dialects cannot be regarded as the unmarked order for Proto-Indo-European (but see P. Friedrich 1976).

Comparative syntactic accentology also supports the conclusion that at an early period the Indo-European verb could move to a marked initial (accented) position in a subordinate clause, while in the main clause it was always in final position and did not have accent (see Bader 1976:31, 43-44, 85-86).

The marked nature of verb-initial order in the Proto-Indo-European system does not, however, rule out the possibility that VSO order occurred in earlier stages of Proto-Indo-European. Moreover, the very possibility of the transformation must be regarded as testifying to the existence of such a structure in the history of Proto-Indo-European. It is reflected in relics in the individual ancient Indo-European dialects: archaic compounds with initial verbs such as Gk. *agē-laos* 'leader of army', etc.; constructions with the prohibitive particle in initial position rather than before the verb, such as Skt. *mā va eno anyakṛtam bhujema* 'may we not answer for the sins committed by others', etc. (see Miller 1975).

dru-tómos 'wood-cutter', *haimato-loikhós* 'blood-licker', *luko-któnos* 'wolf-killer' (which semantically corresponds to the Lydian name *Kan-daülēs*, cf. also Slav. *volko-davŭ* 'wolfhound'; Russ. *volkolak*, *volkodlak* 'werewolf', ORuss. *v"lkojad'nyi* = Gk. *lukóbrōtos* 'wolf-eaten': Ivanov 1965:288-89); *aspidē-stróphos* 'shield-armed, shield-turning', *pur-pnóos* 'fire-breathing', *oino-khóos* 'wine-pourer, wine-server', *andro-phágos* 'cannibal' (*anthrōpo-phágos* id.), *paido-bóros* 'devourer of children', *psukho-pompós* 'accompanier of souls' (of Hermes, Charon), *paido-gónos* 'child-bearer', *broto-phthóros* 'destroyer of mortals', *bou-phorbós* 'bull-feeder' = 'herder', *oiko-dómos* 'house-builder', *harmato-pēgós* 'chariot-maker', *gaiē-okhos* 'earth-embracer' (of Poseidon), *astu-nómos* 'observer of cities', *haimato-rrhóphos* 'blood-lapper', *dēm-argos* 'head of undertaking', *litho-kópos* 'stonemason', *oiōno-skópos* 'observer of birds', 'augur using birds' (cf. Desnickaja 1948:146-47); cf. Mycenaean *ku-ru-so-wo-ko* = *khrusoworgoi* 'goldsmiths', *to-ko-so-wo-ko* = *toksoworgoi* 'bowsmiths', *na-u-do-mo* = *naudómoi* 'shipwrights', *a-to-po-qo* = *artokópos* 'bread-bakers', *a-re-pa-zo-o* = *aleiphakhóoi* 'oilmakers' (Lur'e 1957:254-55); cf. Lat. *signi-fer* 'meaning-bearer', OPers. *aršti-bara* 'spear-bearer', *asp-bāra* 'rider', Skt. *śrad-dhā* 'put faith' = 'believe', Avest. *zrazdā*, cf. Lat. *crēdō*, OIr. *cretim*;⁴ Skt. *jñubādho* 'having bent the knees' (RV VI, 1, 6); OIcel. *knébeðr*, OSax. *kneobeda*, OE *cnēowgebed* 'prayer' (Schmitt 1967:§405); Hitt. *tarumaki* 'woodpecker' < **taru* 'tree' + **wak-i* (*wak-* 'bite, bite off', synonym of 'eat': Kammenhuber 1973-:2, s.v. *ta*, 38, 65); cf. Friedrich 1966:33, Čeidze 1969:73, Haudry 1978:256ff. The ordering of the nominal and verbal elements in all these compounds reflects the regular syntactic positioning of words in an OV syntagma (cf. Lehmann 1969, 1974:76ff.).

6.2. Structural implications of the SOV model in the structure of the Indo-European verb

6.2.1. The SVO and SOV language types. The ordering of elements in the OV syntagma as one of the factors determining the grammatical syntagmatics of a language

A language with SOV as its unmarked order for the clause core (such as Turkish or Japanese) differs from the VO type (as in Semitic, e.g. Biblical Hebrew) in that the SOV order implies a number of structural features having to do with the order of morphological markers in the verb and rules for forming nominal constructions (genitive and object constructions). In particular, the OV type

4. Cf. the same element order in the cognate Hittite construction *karatan dai* 'give interior': *nu-uš-ma-aš* DINGIRDI¹ *eš ta-ma-i-in ka-ra-a-ta-an da-i-ir* 'and the gods put another interior in them' (KBo XXII 2, Vs. A 16).

implies a generally agglutinating character with suffixation on the verb and preposed genitive and adjectival constructions. A typical feature of the type is postpositions, while VO languages have prepositions (for the OV and VO typology and their structural implications see Greenberg 1963, Lehmann 1973a, 1974:15ff.).

It should be kept in mind that the structural implications of the linear order of clause constituents pertain only to surface structure and specifically involve the linear positioning of elements relative to each other. Therefore these surface implications are weaker as implications than those motivated by deep relations surveyed above. A change from SOV to SVO or from SVO to SOV (and all their possible variations) can take place without any restructuring of deep structure. Consequently, these transformations and the structural changes associated with them do not require major shifts in the linguistic system and can be triggered by a variety of extralinguistic factors (substratum, interaction of languages). This is precisely what we observe in the histories of the individual Indo-European languages, which change from SOV to SVO and undergo all the surface structural changes caused by that shift.⁵

The suffixal character of verbal markers and the preposing of adjectives and genitives in OV languages follow from certain general characteristics of OV and VO syntagmas: at one syntactic level they constitute single indivisible wholes within the clause structure.⁶ Hence it is natural that the elements (morphological or syntactic) associated with only one or the other member of the syntagma can be positioned only on the 'free' side of that element, i.e. to the left or right of the whole syntagma but not in the middle. For OV syntagmas the 'free position' principle entails that verb markers are affixed to the V as suffixes while adjectives and genitives are preposed to the O element. For a VO syntagma, the same principle predicts prefixing to the verb and postposing of adjectives and genitives to the O (see Serebrennikov 1974:310ff.).

Auxiliary words marking the connection between the V and O elements, and hence belonging to both V and O, are naturally positioned between the two and are syntactically correlated with both of them. In the OV syntagma such elements are postpositions, while their analogs in the VO syntagma are prepositions. The traditional terminology (*postposition*, *preposition*) treats these

5. It is difficult to agree with Watkins that the question of OV vs. VO order in Indo-European is a 'pseudoproblem' (Watkins 1976:316). The issue is not whether OV and (for some constructions) VO order can both be reconstructed; rather, the problem is to establish which is the basic, neutral, or unmarked order (however the terms *marked* and *unmarked* are interpreted) for the Indo-European sentence. It is the OV order that has this status for Proto-Indo-European, as Watkins himself acknowledges when he proposes a marked verb-initial construction and unmarked verb-final construction for Proto-Indo-European.

6. In Immediate-Constituent grammar and the corresponding part of transformational grammar, at one level of analysis OV and VO are regarded as a single constituent, symbolized as VP. This description is consistent with linguistic intuition showing that there is an especially close connection between these two sentence elements.

elements as associated only with the O, when in fact they are associated with both members of the syntagma. This position can be illustrated with postpositions or prepositions in many languages, where their double syntactic linkage to the nominal and verbal members of the syntagma is clear.

Proto-Indo-European, as an SOV language, shows all of the basic characteristic morphological and syntactic features motivated by the OV element order.

6.2.2. The agglutinative structure of primary and secondary verb endings in Indo-European

The agglutinative character of the suffixal elements is particularly clear in the **-m(i)* and **-Ha* conjugation system and its derivatives.

Primary endings: Secondary endings:

1p.	<i>*-mi</i>	<i>*-m</i>
2p.	<i>*-si</i>	<i>*-s</i>
3p.	<i>*-thi</i>	<i>*-th</i>

The very form of the primary and secondary endings (which express present and past tense respectively in the individual Indo-European dialects)⁷ shows that an element *-i* can be segmented out as a marker of some category:

$$*-mi, *-si, *-thi \Rightarrow *-m + *-i, *-s + *-i, *-th + *-i$$

The tense opposition of verb forms with primary and secondary endings in the historical dialects ultimately goes back to aspect oppositions expressing the nature of the verbal action. Evidence for the original aspectual opposition can still be clearly seen in Sanskrit verbs with injunctive meaning (Thurneysen

7. Thus:

	Hitite	Sanskrit	Greek
Present:			
1sg.	<i>eš-mi</i>	<i>ās-mi</i>	<i>eimí</i>
2sg.	<i>eš-si</i>	<i>āsi</i>	<i>es-sí</i> (Dor.)
3sg.	<i>eš-zi</i>	<i>ās-ti</i>	<i>es-tí</i>
Past:			
1sg.	<i>eš-un</i>	imperf. <i>āsam</i>	Hom. imperf. <i>ēa</i> < <i>*ē-s-m</i>
2sg.	<i>eš-ta</i>	<i>āsīh</i> , Ved. <i>*ās(s)</i>	
3sg.	<i>eš-ta</i>	<i>āsīt</i> , Ved. <i>ās(t)</i>	<i>ēn</i>

8. A view of the endings **-mi*, **-si*, **-thi* as **-m-i*, **-s-i*, **-th-i*, where *-i* has the synchronic function of distinguishing two grammatical types, was formulated in 1908 by Ščerba (1974:103); for the relation of forms in *-m-i*, *-s-i*, *-t-i* to those in *-m*, *-s*, *-t* see also Neu 1976.

1885, Gonda 1956, Elizarenkova 1960:51ff., 120-22; cf. also Hoffmann 1967, Watkins 1969), in the absence of any trace of temporal oppositions in the primary and secondary endings in Celtic (Meid 1963, Watkins 1962:47-48; cf. Thurneysen 1946:§§ 559-65, Lewis and Pedersen 1954), cf. Lat. *sum* < **es-m* (see Foley 1965:64, but cf. Szemerényi 1964:191ff.), and in the different origins of the third-person plural present endings in Tocharian (Toch. A *-ñc* < **-nti* beside Toch. B *-m* < **-nt*, i.e. primary endings in A, secondary in B; the difference must be very old: Lane 1966:219); for the probable origin of the Slavic first-person singular present ending *-o* from the secondary ending **-om* see Belić 1932, Kuznecov 1961:89ff., Toporov 1961:64.

It is also significant that the use of the primary and secondary endings in both Sanskrit and Greek is not associated with a temporal difference (Wackernagel 1924:47): cf. *páros ge mèn ou̯ ti thamízeis* 'you did not come to me often before this' (Iliad 18.386). According to Meid 1963, in **bherethi* the particle **-i* has an actualizing meaning; Martinet 1956 compares the **-i* forms to the English progressive. Watkins 1962:47 sees in the **-i* a *hic et nunc* sign.

That the function of the primary/secondary opposition in Indo-European was originally aspectual rather than temporal⁹ is especially clear in the aorist forms, which take secondary endings: Skt. *ávidat* 'he saw', Gk. *éwide*, Arm. *egit* 'found', cf. Gk. *éluthon* 'I left', etc.; Skt. *á-dhā-m*, *á-dhā-s*, *á-dhā-t* 'put'. The original function of the aorist in Indo-European was to express aspectual oppositions contrasting with the imperfect (which also had secondary endings) and the present (primary endings): cf. the semantics of the Sanskrit aorist (Kurylowicz 1964:13ff., Watkins 1969, Elizarenkova 1960; for Indo-European verbal categories see Hoffmann 1970).

The segmentability of the **-i* in the primary endings and its original aspectual rather than temporal meaning are also clear in the third-person imperative in *-u*, which replaces *-i*:¹⁰ Hitt. 3sg. imper. *eš-d-u*, 3pl. *aš-and-u*,¹¹ Luw. *aš-d-u*, *aš-and-u*, Pal. *aš-d-u*, *aš-and-u* 'may (he/she/it) be', 'may they be'; Skt. *ástu*, *sántu*, Avest. *astū*.

9. Important evidence that forms with secondary endings like Hitt. *-ten* originally had aspectual rather than temporal meaning is the fact that they fell in with the second-person plural imperative ending (Hitt. *-ien*, Skt. *-tana*). Analyzing a typologically similar phenomenon in Ket (Yeniseian), where the past perfective tense coincides with the imperative (*boy-na* 'lit the fire' and 'light the fire!', beside present *b-ok-s-it* 'I light the fire'), Krejnovič (1968:15) notes: "The formal coincidence of imperative and past-tense forms noted for these verbs shows clearly that the formatives in question are not tense markers. After all, the imperative indicates an action which is only about to take place. How could affixes with past-tense meaning be placed on forms with future meaning? These are then markers of completion of action (perfect), not tense."

10. In terms of the sequential grammar used below, elements which belong to the same rank and are therefore mutually exclusive should express some generic category; this precludes a primary temporal function for *-i*.

11. Cf. also the Hittite 'imperative' 1sg. *ašallu* 'may I be', with the same ending *-u*. This *-u* can also be seen in the second-person imperative mediopassive ending *-hut*, OHitt. *-huti*; cf. *ešhut* 'sit down', *kišhut* 'become', *arhut* 'get up'.

An important factor in the affixation of **-i* to the personal endings is the character of the verb stem taking the personal endings. The endings **-m-*, **-s-*, **-th-* are characteristic of athematic stems and **-[o]H*, **-s-*, **-th-* of thematic stems:

Thematic type

Present

1sg. <i>*-[o]H</i>	Skt. <i>bhāvāmi</i> 'I become'	Lat. <i>uehō</i> 'I convey, carry'
2sg. <i>*-e-si</i>	<i>bhāvasi</i>	<i>uehis</i>
3sg. <i>*-e-thi</i>	<i>bhāvati</i>	<i>uehit</i>

Past

1sg. <i>*-o-m</i>	Gk. <i>épheron</i> 'I brought'	Skt. <i>ābhavam</i>
2sg. <i>*-e-s</i>	<i>épheres</i>	<i>ābhavas</i>
3sg. <i>*-e-th</i>	<i>éphere</i>	<i>ābhavat</i>

Consequently, the specificity of the thematic and athematic verb stems in regard to their personal endings lay in the fact that the thematic type took as its primary ending in the first-person singular **-[o]H*, while the athematic type took **-m-i*.

The **-o-m* as a secondary ending for first-person singular in thematic stems makes it possible to regard the primary ending **-oH* as a recoding of a regular **-o-mi* which neutralizes the function of **-i* as a marker of the present tense (an earlier aspectual opposition). A connection of the **-oH* ending to the first-person singular ending in the **-Ha* series cannot be ruled out. Then we would have an example of two verbal paradigms influencing each other, with forms from one paradigm expanding to the other (similar examples will be given below for the middle paradigm).

It may be concluded that the opposition of primary to secondary endings of thematic verbs, marking the present and past tense respectively (or the older aspectual meaning), is an innovation within Indo-European dialects under the influence of the athematic paradigms. In fact, the earliest Indo-European dialects preserve clear evidence of an earlier indifference of the thematic conjugation as to primary vs. secondary endings, and hence of indifference to the relevant temporal, or earlier aspectual, feature. The full thematic paradigm, with its opposition of primary to secondary endings, is found only in Sanskrit, and there the first-person singular form is extended by an additional **-mi* ending by analogy to the athematic paradigm, so that there is a consistent opposition of primary endings in **-i* to secondary endings without **-i*: *bhāvāmi* from **bhavā-* + **-mi*; the original **-ō < *-oH* is preserved in Greek, Latin, and other languages.

In other dialects, what are called thematic primary endings clearly do not all

go back to endings with a final **-i*. They most often lack **-i* and hence show a connection to the secondary endings: Lat. *uehis*, *uehit*, Gk. *phéreis*, *phérei*, etc. The interpretation to be drawn from this is that the primary and secondary endings of the thematic conjugation were not in opposition based on the presence or absence of **-i*. This opposition can be said to be neutralized in the thematic conjugation. In the athematic type, however, it is expressed by means of a consistent opposition of endings in **-i* to endings without **-i*. This opposition extends to the thematic type in Sanskrit and only in Sanskrit, and can therefore be seen as a specifically Sanskrit innovation (see Saussure 1879:10, Meillet 1931a, Renou 1925, 1932, 1952: § 326, Hoffmann 1967, Watkins 1969:63, §§ 41, 42).

The absence of a primary/secondary opposition in the thematic conjugation to render the tense or earlier aspectual oppositions expressed by the athematic forms can be interpreted as showing that the original function of the thematic vowel was to express some aspectual parameter; given this aspectual meaning, additional marking with **-i*, which carried an aspectual meaning, would have been superfluous or contradictory. These two elements were complementary formatives which conveyed incompatible (or possibly identical) grammatical meanings.

When the thematic vowel lost its original function in a number of dialects, a secondary opposition of primary and secondary endings in **-i* arose in the thematic conjugation. The result was a certain symmetry between the two conjugation types, which is most fully manifested in Sanskrit.

6.2.3. *The agglutinative structure of middle verb endings in Indo-European*

The agglutinative character of verb markers in Indo-European is especially clear in the principles for formation of middle verbs. The verb forms expressing reflexivity and reciprocity in Indo-European were formed from both **-mi* and **-Ha* series verbs by adding agglutinative markers of middle voice to the endings, with consequent contamination of certain **-mi* and **-Ha* forms. The various middle formations of the Indo-European dialects cannot be reduced to a single source model, which shows that the middle as a distinct category is recent and areally or dialectally conditioned within Proto-Indo-European.¹²

One of the dialectal middle types is formed by adding a middle marker **-o-* to the **-m(i)* series endings. Consequently there are two series of endings for the middle, reflecting the primary and secondary endings:

12. For the history and changes of the middle forms in the individual dialects see Meid 1971, 1977, Jasanoff 1973.

	Primary endings:	Secondary endings:
1p.	*- <i>m-o-i</i>	*- <i>m-o</i>
2p.	*- <i>s-o-i</i>	*- <i>s-o</i>
3p.	*- <i>th-o-i</i>	*- <i>th-o</i>

Another dialect type is formed from the **-Ha* endings by adding an agglutinative element **-r(-i)* (also **-dh(-i)* in the second person) (for the structure of these forms see Cowgill 1972, 1970:142):

1p.	*- <i>Ha-r(i)</i>
2p.	*- <i>tha-r(i)</i> /*- <i>tha-dh(i)</i>
3p.	*- <i>e/o-r(i)</i>

The presence of two areally distributed middle paradigms in Indo-European led to contamination of the two conjugation types, with forms from one entering the other. For instance, the middle **-mi* paradigm shows clear evidence of first-person endings from the **-Ha* paradigm, while in the third person the **-Ha* paradigm shows intrusive **-mi* endings. The result is contaminated paradigms for the middle in the various Indo-European dialects, with forms showing the influence of both paradigms.

Middle forms of the **-mi* series are found primarily in Greek:

	Primary endings:	Secondary endings:
1sg.	- <i>mai</i>	- <i>mān</i>
Arc.-Cypr. 2sg.	- <i>soi</i>	- <i>so</i>
Arc.-Cypr. 3sg.	- <i>toi</i>	- <i>to</i>

In the *ā* of the first-person singular we can see contamination with the first-person singular ending of the **-Ha* series.

Similar contamination obviously took place in the first-person form of Sanskrit:

	Primary endings:	Secondary endings:
1sg.	- <i>é</i> < Indo-Iran. <i>*-ai</i>	- <i>í (-á)</i> (see Cowgill 1968)
2sg.	- <i>sé</i> < Indo-Iran. <i>*-sai</i>	- <i>thās</i>
3sg.	- <i>té</i> < Indo-Iran. <i>*-tai</i>	- <i>tá</i>

The second-person secondary ending, too, shows the clear influence of the **-Ha* series ending.

The middle paradigm formed from the **-Ha* series is most clearly reflected in Hittite:

	Present	Past
1sg.	-(<i>ḥa</i>) <i>ḥa(ri)</i>	-(<i>ḥa</i>) <i>ḥa-t(i)</i>
2sg.	- <i>ta(ti)</i>	- <i>ta-t</i>
3sg.	- <i>a(ri)</i> /- <i>ta(ri)</i>	- <i>a-t</i> /- <i>ta-t</i>

The *-ta(ri)* and *-a(ri)* endings (cf. *kiš-ari* 'becomes', past *kiš-at*; *eš-ari* 'sits down', past *eš-at*; but *ki-tari* 'lies', past *ki-tat*) synchronically reflect the two conjugation types in *-mi* and *-hi*; the presence of two endings in the third person reflects the historical influence of the Indo-European middle series in **-mi*.

The middle paradigms in Celtic and Italic also reflect the **-Ha* series with influence from the **-mi* series:

OIr.	1sg.	- <i>ur</i>	Lat.	-(<i>o</i>) <i>r</i>
	2sg.	- <i>ther</i>		- <i>re</i> /- <i>ris</i> < <i>*-so</i> / <i>*-sis</i>
	3sg.	- <i>thir</i>		- <i>tur</i>

The third-person endings of these paradigms, and the Latin second person, reflect the endings of the middle paradigm in **-mi*.

The middle paradigms of Tocharian are different in structure. The *-r* ending is added not to the **-Ha* ending but to the **-m(i)* series, while the second person reflects the **-Ha* series (see Cowgill 1972):

	Tocharian A	Tocharian B
1sg.	- <i>mār</i>	- <i>mar</i>
2sg.	- <i>tār</i>	- <i>tar</i>
3sg.	- <i>tār</i>	- <i>tār</i>

In summary, the middle endings of the historically attested Indo-European languages can be explained by positing two middle paradigms, one based on **-mi* series endings and one based on **-Ha*. Neither paradigm is represented in any one historical Indo-European language in a pure form uncontaminated by the other. For Proto-Indo-European we must posit both paradigms, areally distributed, which is evidence that they arose relatively late in Indo-European.

The middle paradigm could have arisen in the Indo-European verb system only when subject-object relations and distinct forms for direct and indirect objects had appeared.

6.3. The version relations of the Indo-European middle in typological perspective¹³

6.3.1. The Indo-European middle as a means of expressing version relations

The rise of the middle conjugation in Indo-European had to do with the need to convey the semantics of version, a category expressing directedness of action and the person the action is intended for. A category of version could naturally develop when there was a semantic opposition of centripetal verbs expressing directedness of action toward the subject to centrifugal verbs expressing action directed away from the subject.

A category of directedness, or version, semantically requires an additional participant in the action or situation, one for whom the action is designated. If the performer of the action is semantically characterized as an agent and the one undergoing it as a patient, the person for whom the action is performed can be termed a *beneficiary* (abbreviated here as D for 'designee'). *Beneficiary* is to be distinguished from the *addressee* function of an argument in an oblique (dative) case (see Gamkrelidze 1979a). In (1) the argument *him* (in the dative case in a language having cases) is an addressee, while in (2) it is a beneficiary.

- (1) *I wrote him a letter*
- (2) *I killed him an animal* (i.e. killed an animal for him)

Both addressee and beneficiary can appear in the same clause:

- (3) *I sent him (Ad) a book for her (D)*

The category of version is closely linked to the category of inalienable possession in possessive pronouns. Constructions with a beneficiary can often be transformed into possessive constructions, e.g. in German (4) can be transformed into (5) with preservation of meaning:

- (4) *Er hat mir die Hand verwundet*
- (5) *Er hat meine Hand verwundet*

Cf. also Lat. *manūs sibi lauat* ⇒ *manūs suās lauat* 'he washes his hands' (Kurylowicz 1964).

Often, a version construction like (4) is correct in one language while a possessive construction like (5) is correct in another:

13. [*Version* is the standard English term for a Georgian verbal affix which registers a derived indirect object and indicates whether it is coreferential to the subject. — JN.]

(6) German: *Ich wasche mir die Hände*

(7a) Russian: *Ja moju (sebe) ruki*

(7b) French: *Je me lave les mains*

(8) English: *I wash my hands*

(6-7) are version constructions, and (8) is possessive. (See Fillmore 1968:61ff., Kurylowicz 1964:75.)

A universal category of version is present in the content plane of every language, but does not receive explicit grammatical expression in the verbal structure of every language. The Kartvelian languages express version relations by means of special prefixes on the verb. The markers in Georgian are *-i-* for subject version ('for oneself'), *-u-* for object version ('for him') (in the following examples, VM = version marker):

(9) *v-a-k'eteb* 'I do' (neutral version)

1 VM do

(10) *v-i-k'eteb* 'I do for myself' (subject version)

1 VM

(11) *v-u-k'eteb* 'I do for him' (object version)

1 VM

(See Šanidze 1973:323ff., Boeder 1968.) Compare also (12) from Georgian with (6) and (8) above:

(12) *v-i-ban xels* 'I wash my hands'

1 VM wash hand-DAT

The Indo-European middle was originally oriented toward marking the semantics of version, and was based on verbal paradigms with centripetal meaning. That the earliest meaning of the middle was version is still clear in the earliest forms from ancient Indo-European dialects. For instance, the opposition of Skt. *yájati* 'he performs a sacrifice' (for someone else, as priest) and *yájate* 'he performs a sacrifice for himself' (not as priest but as sacrificer) shows clearly that the Indic middle was a version category.¹⁴ This was noted by Panini in an observation that is strikingly insightful for its time. For Panini, a middle is the 'word for oneself' (*ātmane-padam*), while the active is the 'word for another' (*parasmai-padam*).

14. For the Indo-European middle as a version form see Šanidze 1946:170, 1969; Schmidt 1965.

Cf. also Gk. active *daneízein* 'lend' (i.e. give as loan to another) and *daneízeisthai* 'borrow' (i.e. take as loan for oneself), and their Gothic translations *leihvan* 'lend', *leihvan sis* 'borrow', lit. 'loan for oneself' (Wackernagel 1924, Lehmann 1973:87). Note also Gk. *dōra phéreí* 'he brings gifts' beside *dōra phéretai* 'he brings gifts intended for himself' (Benveniste 1966a:173, 1974:184ff.).

This ancient meaning for the Indo-European middle is established by comparing active and middle forms in the oldest dialects — Hittite¹⁵ (Neu 1968), Sanskrit, Greek (Perel'muter 1974:76-77, 1977:160ff.). The comparison shows that a two-member category of version appeared within centripetal verbs, distinguishing subjectival and non-subjectival version meanings (see Strunk 1980). The middle endings give the verb subject-version meaning, and the non-middle (active) endings mark non-subject version.

Unlike Kartvelian, where version is a three-way opposition of subject to object to neutral version, in Indo-European it was from the very beginning a two-member opposition of subject to non-subject version. In other words, the beneficiary was always coreferential to the subject; there is never morphological marking of an object-controlled beneficiary in the Indo-European verb. This is why the Indo-European category of version is binary while the Kartvelian one is trinary. The binary version category of Indo-European reflects a binary opposition of ancient Indo-European verb forms as centripetal vs. centrifugal, reflecting the old division of nominal (and consequently verbal) forms into active and inactive classes.

The semantics of subject version indicated that the action was directed at the subject, and provides one kind of evidence that the original Indo-European verb series in **-Ha* was centripetal in meaning.

From the formal-descriptive point of view, Indo-European subject version can be seen as due to a version transformation of the corresponding active form:

$$\begin{array}{cc}
 \text{active} & \text{subject version} \\
 S \quad V \left\{ \begin{array}{l} -e \\ -thi \end{array} \right\} (O) & S \quad V \left\{ \begin{array}{l} -o-(ri) \\ -th-o-i \end{array} \right\} D \quad (O)
 \end{array}$$

where D symbolizes the subject-controlled beneficiary. Thus the agglutinative elements **-o-* (in the **-m(i)* series) and **-r(i)* (in the **-Ha* series) express the semantics of subject version and are suffixal markers of the category of version.

15. Cf. Hitt. *nu-za-kán ŠUḪI.A-uš a-ar-ri* (KBo IV 2 III 26) 'and he washes his hands'; LUGAL-uš-za-kán ŠUḪI.A.ŠU a-ar-ri (KUB XX 99 III 18) 'the king washes his hands' beside Skt. *pāñīśva nenikṛe* 'he washes his hands' and Homeric *nīpsato* (= Hitt. *-za*) *d' autòs kher'ras* (= Hitt. ŠUḪI.A) 'and he washed his hands' (Iliad 16.230).

6.3.2. *The change in the Indo-European middle due to transitivity and the appearance of analytic expressions of version relations. Middle and passive*

A later semantic transformation of the middle from a version marker to a marker of intransitivity (opposed to transitive active verbs) entailed the appearance of analytic forms in which version relations were marked by pronominals.

In addition to the only ancient Indo-European pronoun marker of a subject-controlled beneficiary, **s-* or **śo-* (Lat. *sē*, *suī*, *sibī*, Gk. *hé*, *hoû*, *hoî*, OCS *svojĭ*, Skt. *svá-* 'one's own', *svayám* 'oneself', Avest. *xva-* 'one's own'), forms of diverse provenience appeared in the various dialects: Gk. *autós*, *phílos*, *sphéteros*, Skt. *atmán-*, Lat. *ipse*, Ger. *selbst*, etc.; for Hitt. *-za*, Luw. *-ti* see below. A word expressing reflexivity — the lexical equivalent of version relations — was lacking in the protolanguage (Delbrück 1893-1900:III.477ff., 497).

As the category of transitivity arose and solidified in Indo-European, the middle, which originally indicated version relations, acquired the function of marking intransitivity. It was opposed to the active forms of the **-mi* and **-Ha* series, which marked transitivity. The Indo-European verb system changed in the direction of expressing transitivity as its central category, and the formal means of the language were recruited for this purpose. The semantically centripetal subject-version forms naturally became the means for marking intransitive semantics.

This semantic evolution of the middle can be traced in data from a number of ancient Indo-European dialects. This is true of Hittite, where the formal-semantic shift can be traced in the written period (Neu 1968:56, 62, 63, 80, 196), and also Greek (Schwyzer and Debrunner 1950:II.235, Debrunner and Scherer 1969:113) and Sanskrit (with reflexive meaning in late Sanskrit: Bloch 1934).

In the course of this change, the middle verb forms acquired primarily intransitive meaning and were later grammaticalized as passives, as is reflected in the exclusively intransitive meaning of middles in Latin (where the passive developed from the Indo-European middle: Wackernagel 1924), Tocharian (primarily passive meaning with traces of the old middle meaning: Krause 1959:63), Germanic (Guxman 1964:262), and later Greek (Perel'muter 1974:77, 197-7:137ff.).

At the level of deep relations, the passive is a separate diathesis, distinct from the version category that was expressed by the Indo-European middle. In the synchronic functioning of a linguistic system, the passive is the result of applying a passive transformation to active structures, which causes conversion of the logico-semantic subject and object relations. While in an active construction

(Figure 1) there is a direct relation between the logico-semantic subject and object (S, O) and the grammatical subject and object (<S>, <O>), in a passive construction (Figure 2) the logico-semantic subject is expressed by a grammatical object while the logico-semantic object bears the function of grammatical subject.

Figure 1

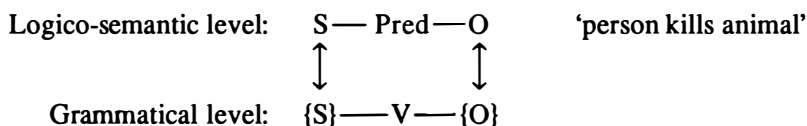
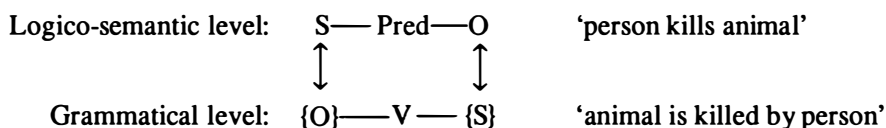


Figure 2

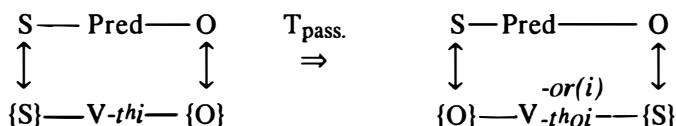


The diathesis created by the passive transformation is characterized by conversion of the relations between logico-semantic and grammatical units:

$$S \rightarrow \{O\}, \quad O \rightarrow \{S\}$$

With passivization, a transitive verb becomes intransitive:

Figure 3



In version constructions, however, the grammatical subject and object are in direct relation to the corresponding logico-semantic entities. The essential thing is that the logico-semantic beneficiary finds explicit grammatical expression in the verb form in addition to the logico-semantic object, i.e. a version-marked

verb form reflects the following logico-semantic structure:

S—Pred—D—O

When the referents of beneficiary and subject are identical, we have the subject version marked by the Indo-European middle forms.

6.3.3. Centripetal verb forms in Indo-European and the hypothetical meaning expressed by the perfect

The change of Indo-European middle forms marking version to forms with passive meaning is explained by the fact that the two constructions share the semantics of centripetal action, action directed inward toward the grammatical subject (which can be logico-semantic subject or object). The subject-version meaning of the Indo-European middle constructions provides a natural basis for the subsequent shift of these constructions to passives proper. It also explains why the middles could shift to a reflexive meaning (where the direct object and subject are referentially identical, a fact that must have been favored by the inalienable possession implicitly present in subject version: see Kuryłowicz 1964:75).

The centripetal nature of the Indo-European middles also links them to the Indo-European perfects and a number of other intransitive verbal structures. Only from this point of view can it be understood why the middle and intransitive paradigms are identical and why they are related to the perfect, which originally indicated a state resulting from prior action.

This property of the Indo-European perfect forms also explains the fact that they carry an implicit meaning that may be termed *hypothetical* [or *evidential* — JN]. Since the action referred to by a perfect took place in the past and the speaker is witness only to its resultant state, he perceives the action as having taken place in his absence, hence as a hypothetical event which he knows of only from its results.¹⁶

In Greek and Indo-Iranian, the perfect was the form usually used with negation (Grünenthal 1933). This also explains the fact that in individual dialects, in particular Slavic, the functions of the perfect were later taken over

16. This meaning for perfects is especially clear in Kartvelian, where the Series III (inverse, perfect) verbs have “evidential” (“quotative”, i.e. reported but not witnessed) meaning: Geo. *dauc’eria* ‘he must have written’, *gauk’etebia* ‘he must have done’. Typologically, the distinction of ‘seen’ (*naxulis žgupi*) vs. ‘unseen’ (*unaxavis žgupi*) in Georgian grammar (Šanidze 1973:211ff.) is comparable to Panini’s distinction of *parokṣā* vs. *aparokṣe* for the perfect (Schmidt 1964:9); cf. also the Bulgarian evidential forms which go back to Slavic perfects: *zaminala* ‘it (ship) is said to have sailed’ (Jakobson 1971a:135, Andrejčin 1938; for Macedonian see Lunt 1952; for the general typology of evidentials see Xolodovič 1946:196-97 on Japanese).

by verb structures which originally had hypothetical meaning: the Slavic form in *-l(ŭ)* (Kuryłowicz 1970-72), which preserved modal meaning (Borodič 1963, Galton 1962), as did the cognate Tocharian forms in *-lye* (Thomas 1952; cf. Benveniste 1959:97, 1936), Armenian forms (*sireli* 'one who is to be loved', 'dear'), and Hittite-Luwian forms like *dalugnula-* '(those which) are to be lengthened', *barganula-* '(those which) are to be raised' (Pedersen 1947, van Brock 1962, Benveniste 1962a:18-20, Ivanov 1968:270-72, Solta 1970). In particular, in Old Church Slavic texts we can observe a shift to a perfect in *-l(ŭ)* accompanying negation: the perfect *něstŭ sŭtvorilŭ* 'did not do' corresponds to aorist *sŭtvori* (Borodič 1963:9, 12, 15). There is an analogous correlation of perfect and negation in Georgian, where a past-tense positive verb form (aor. *da-v-c'er-e* 'I wrote', *da-v-xat'-e* 'I drew') changes to a third-series (perfect) form with negation: *ar da-m-i-c'er-ia* 'I did not write', *ar da-m-i-xat'-av-s* 'I did not draw'.

In Baltic, the old Indo-European perfect is reflected only in negative forms: Latv. *nevaids* 'no' < 'unknown'¹⁷ (Endzelīns 1951:§ 601a, Stang 1966:416). See Stang also for Lith. *yrà* 'is' in *něrà* 'is not'; Old Lithuanian has *ēsti* 'is' in translations from Polish and *něrà* with negation: *něrà Diēvo* 'there is no God', Pol. *nie masz Boga* (Ford 1967).¹⁸ For the etymology of the *-r* in *něrà* see Ivanov 1968:235-38, 269; see Watkins 1969:195-97 for verb forms in **-r* as related to the particle **r* of Homeric *ár*, *rha* (*stē rha*, Iliad 7.225), Toch. B *ra*.

6.4. The sequential structure of the Indo-European verb

6.4.1. The ordering of suffixes in **-mi* series verb forms

Consistent with the OV type, a number of verbal categories — subjunctive, optative, causative, etc. — are morphologically expressed on the verb with agglutinative suffixal markers. Like the middle markers analyzed above, they adhere to the basic principle of agglutination: the individual markers are clearly segmentable, each as a rule expressing one grammatical meaning, one grammeme. Any given marker or group of markers has a strict ordering in the verbal morpheme sequence.

In Indo-European, the verb root is immediately followed by the thematic vowels **-e-/*-o-*, which are thus morphemes filling the first sequential position after the root, a position here labeled Rank 1. Following them, in rank position

17. There is a partial typological parallel in the development of 'know' to 'experience' under negation (Buyssens 1959).

18. For Polish *nie masz* (15th-19th centuries; lit. 'you do not have'), later *nie ma* 'there is not', lit. 'does not have', see Śmiech 1966, Bendix 1966:131. For typological parallels to the distinction of negative and positive 'be' (Polish neg. *nie ma*, pos. *jest*; Lith. neg. *něrà*, pos. *ēsti*) see Locker 1955:549-50.

2, are the subjunctive markers **-e-/*-o-* or the optative **-yeH-/*-iH-*. In athematic forms, Rank 1 remains unfilled and a morpheme of Rank 2 (the subjunctive marker) is affixed directly to the stem:

Indicative:	*ei-mi	'I go'
	*ei-si	'you go'
	*ei-thi	's/he goes'
Skt. <i>é-mi, é-ṣi, é-ti</i>		
Subjunctive:	*ei-oH	'I would go'
	*ei-e-s(i)	'you would go'
	*ei-e-th(i)	'he would go'
Skt. <i>áy-ā(ni), *ay-as(i), áy-at(i)</i>		

Ranks 1 and 2 are both filled in thematic verbs:

Indicative:	*bher-oH	'I carry'
	*bher-e-si	'you carry'
	*bher-e-thi	's/he carries'
Skt. <i>bhárāmi, bhárasī, bháratī</i>		
Gk. <i>phérō, phéreis, phérei</i>		
Subjunctive:	*bher-oH	'I would carry'
	*bher-ē-si	'you would carry'
	*bher-ē-thi	'he would carry'
Skt. <i>bhárā(ṇi), *bharās(i), bhārāt(i)</i>		

The long **-ē-* of the Indo-European subjunctive forms must reflect fusion of two markers: the thematic vowel **-e-/*-o-* and the subjunctive marker **-e-*:

*bher-ē-si	<	*bher-e-e-si
*bher-ē-thi	<	*bher-e-e-thi

The optative marker **-yeH- / *-iH-* occupies the same second rank:

Athematic optative:	*s-yeH-m	'I would be'
	*s-yeH-s	'you would be'
	*s-yeH-th	'he would be'

Skt. *syām, syās, syāt*
OLat. *siem, siēs, siet*

Thematic optative: *bher-o-iH-m	'I would carry'
*bher-o-iH-s	'you would carry'
*bher-o-iH-th	'he would carry'

Skt. *bháreyam, bháres, bháret*

The fact that both the indicative and the subjunctive belonged to Rank 2 shows that they were functionally similar, expressing different aspects of a single category of modality (in opposition to the indicative, expressed by the absence of an affix in this rank): see Gonda 1956.¹⁹ The fact that the Rank-1 thematic vowel is identical to the subjunctive marker of Rank 2 may indicate that they are historically identical and functionally related. Only in late Indo-European did the markers of this series apparently split to yield formatives of two different ranks.

Evidence for earlier functional similarity of the subjunctive and the theme vowel comes from the first-person singular form in **-[o]H* which is common to the subjunctive and thematic indicative conjugations; cf. the forms of **es-* 'be', subjunctive 1sg. **es-oH*, 2sg. **es-e-s(i)*, 3sg. **es-e-th(i)*, reflected in the Latin future *erō, eris, erit* and the Celtic present subjunctive: OIr. 1sg. *beo* < **(b)esō*, **(b)eses*, **(b)eset* (Watkins 1969: §40, 62, Szemerényi 1970:238-39).

The opposition of primary and secondary endings, with and without **-i*, in the subjunctive second and third persons dates to the later period when the full system of primary and second endings developed in Sanskrit. In the Rigveda we can see clear evidence that there was no temporal opposition based on primary vs. secondary endings in the subjunctive: cf. Ved. *ásat* 'would be' (24 times in the Rigveda) in the meaning of an atemporal subjunctive, parallel to *ásati* (6 times in the Rigveda), *kárat* and *káratī* (beside indicative *kṛṇōti* 'makes'), *gámat* (indicative *gácchati* 'goes'), *yámati* (indicative *yácchati* 'presents, gives'): Watkins 1969:§ 44, 64-65, Kurylowicz 1964, Gonda 1956.

The same Rank 2 also contains the causative **-ye-*, which follows the thematic vowel:

***bher-e-thi** 'carries' ⇒ caus. ***bher-o-ye-thi** 'makes carry'

Skt. *bhárati*

bhāráyati

Gk. *phérō*

phoréo

The fact that the causative suffix occurs in Rank 2, where modal markers such as subjunctive and optative occur, suggests that the causative originally had modal or aspectual semantics and only later became a true causative. An

19. The meaningful absence of an affix in the indicative must be analyzed as a zero affix marking the indicative, standing in opposition to overt affixes marking the other analogous categories of subjunctive and optative.

originally aspectual meaning can be detected in the use of causative forms like Homeric *phorēō* in contexts like *autàr ho aûte Thuést' Agamémnoni léipe phorēnai* 'and Thyestes left it in turn to Agamemnon to carry' (Iliad 2.107), where the causative *phorēnai* is simply translated 'carry' (Kuryłowicz 1964:86). Other pairs in Homer are:

phobéomai : *phébomai* 'be afraid'
troméō : *trémō* 'tremble'
tropéō : *trépō* 'turn' (intrans.)

These represent an aspectual rather than a causative opposition. Cf. also OCS *iz-baviti* 'save' beside Skt. *bhāvayati*, causative of *bhū-*, *bhāvate* 'be'; OCS *saditi* 'seat, plant' beside Skt. *sādayati* 'plant', causative of *sad-* 'sit'; Lat. *spondeō* 'perform solemn ceremony' beside Gk. *spéndō* '(I) perform libation, sacrifice', Hitt. *šipandahhi* '(I) perform sacrifice'; and others.

The *-ye- causative suffix of late Indo-European evidently reflects an earlier suffix with some modal or aspectual meaning, one which opposed verbs in *-ye- to verbs with other markers from the same rank, which had other modal meanings. Only later, when the binary opposition of transitivity had arisen, did one of the modal-aspectual suffixes acquire the transitive function of causation and the ability to make intransitives transitive or raise the valence of transitive verbs by one.

The third rank comprised the personal markers: first person *-m-, second person *-s-, third person *-th-.

The fourth rank contained the subject-version marker *-o-. Since the form in *-o- was opposed to a form without *-o- marking non-subject version, a zero suffix must be posited as a marker of non-subject version.

The fifth, and last, rank comprises the present-tense suffix *-i and the imperative *-u; recall that their membership in a single rank indicates that *-i originally had an aspectual rather than temporal function. Since a form without *-i is opposed to the present-tense (formerly injunctive) forms with *-i, we must posit a zero marker with past-tense meaning.

In a sense the second-person imperative stands outside of the rank structure of the verb. Its form is the bare root with only the Rank-1 thematic vowel; all other ranks are removed:

Athematic stem: *eī 'go!' (Lat. *ī*; cf. forms with later particles: Skt. *i-hí*, Gk. *i-thi*, Lith. *eī-k*).

Thematic: *ak'e 'bring!' (Lat. *age*, Gk. *áge*, Skt. *ája*).

A second-person imperative without sequential structure (i.e. a bare verbal stem) is common among the world's languages and can be regarded as a typological universal which may find its explanation in features of child language.

The rank structure of segmented Indo-European verb forms of the *-mi series can be represented as in Table 1.

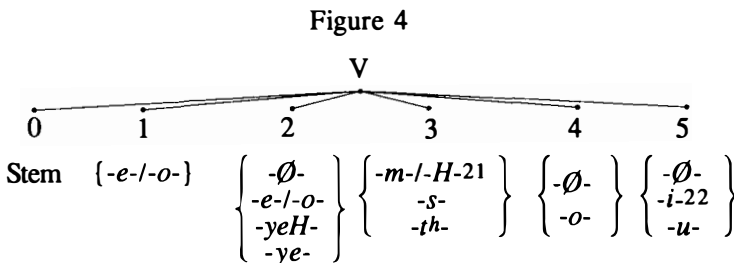
Table 1
The sequential structure of segmented verb forms of the **-mi* series

Morpheme Rank:	0	1	2	3	4	5
Morpheme Sequence:	Stem	Thematic vowel	Subjunctive Optative Causative	Person markers	Subject version	Present tense (aspect) Imperative

Notes

1. Stem → Verb stem, including stems with derivational suffixes such as **-škh-*, **-aH-*, **-o-*, etc.
2. Thematic vowel → **-e-/*-o-*
3. Subjunctive → **-e-/*-o-*
4. Optative → **-yeH-/*-iH-*
5. Causative → **-ye-*
6. Person markers →
$$\begin{array}{l} 1 \\ 2 \\ 3 \end{array} \left\{ \begin{array}{l} *-m-/*-H- \\ *-s- \\ *-th- \end{array} \right\}$$
7. Subject version → **-o-*
8. Present tense (aspect) → **-i-*
9. Imperative → **-u-*

When zero suffixes are taken into account, the full morpheme sequence in a **-mi* series verb can be represented as in Figure 4, which shows the expansion of a verb V into its components.²⁰



20. This is in essence a sequential (rank) grammar for the Indo-European verb, comparable in general method to the sequential grammar reconstructed by Gelb 1969 for Proto-Akkadian (Semitic).

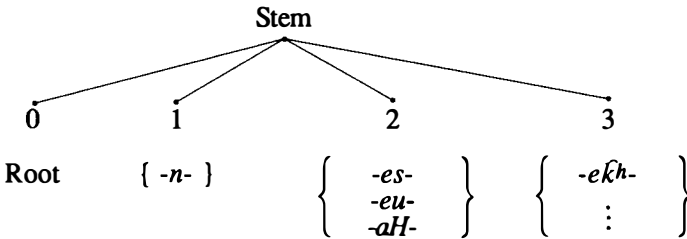
21. **-H-* occurs as the first-person marker rather than **-m-* when Rank 1 is filled, i.e. in thematic stems. This shows that there was some mutual dependency between Ranks 1 and 3. The same first-person marker **-H-* also appears with the Rank-2 subjunctive suffix, which indicates dependency between Rank 2 and 3 affixes. These synchronic relations among the affixes of the various ranks can be diachronically described as identity of the Rank 1 thematic marker **-e-/*-o-* and the subjunctive marker used as a Rank 2 affix (for other evidence of this identity see Renou 1932, Watkins 1969:63-65).

22. When Rank 1 or **-e-/*-o-* of Rank 2 is present, Rank-5 **-i* cannot be present. The incompatibility of these affixes shows either that they are semantically opposed within a single grammatical category, or that they are semantically incompatible.

6.4.2. The ordering of suffixes in the verb stem

The stem, the Rank-0 element of the word, has a complex internal structure of its own, consisting of the unanalyzable root plus other elements. These elements include the suffixes **-n-*, **-k̥h-*, **-eu-*, **-es-*, **-aH-*, etc. They attach to the root in a fixed order, as shown in the verb stems containing these elements in the attested Indo-European languages:

Figure 5



The only restriction on a three-rank stem is that the Rank 2 element can only be **-es-*. Thus a stem with all ranks filled, Root-1-2-3, has the suffix **-n-es-k̥h-* as, for instance, in the class of verbs in *-nāsk-* in Tocharian, *-nešk-* in Hittite;²³ these clearly go back to forms of maximal rank structure in Proto-Indo-European.

A two-rank structure can consist of the possible rank combinations 1-2, 2-3, and 1-3. Examples of Root-1-2:

**-n-(e)s-*:

Hitt. *iyanneš* ‘he moved constantly’ (on a campaign) (3sg. past in the form of a bare stem, cf. 2sg. imperative *iyanniš*, KUB XXIV 8 II 7: Sommer and Falkenstein 1938:176ff.).

Hitt. 2pl. imper. *tarniš-ten* (cf. *tarna-* ‘let’); Skt. *śi-n-áṣ-ṭi* ‘leaves’ (Kuiper 1937:40), Gk. *kunēō* ‘(I) kiss’: **k̥h-n-es-* (Puhvel 1960:31).

**-n-(e)u-* (cf. Sanskrit Class V):

Hitt. *arnu-* ‘bring’, Skt. *ṛñóti* ‘he moves, ascends’, Gk. *órñūmi* ‘(I) wake’; Skt. *śṛñóti* ‘hears’, OIr. *ro-cluinethar* < **k̥h-n-u-thro* (Marstrand 1924:19ff.).

Hitt. *tepnu-* ‘belittle’ (cf. Hitt. *tepu-* ‘small’), Skt. *dabhnóti* ‘brings harm, damages’, cf. OCS *poměnŋti* ‘understand; remember’ (from **m̥n-n-eu-*).

23. Hitt. *tiyanešk-* (*tiyaneškimi* ‘(I) sew up, mend’, KUB VII 53 II 17: Goetze 1938:77ff., Friedrich 1957:21), *tarnešk-*, *tarnašk-* (KUB XXX 28 I 27) from *tar-n-* ‘let, let go’, cf. *taršik-* (KUB XXIII 72 II 41), *taršk-* (KUB XXIV 9 II 42).

*-*n-(a)H-* (cf. Sanskrit Class IX):

Skt. *mṛṇāti* 'grinds'; Hitt. *watarnaḥḥ-* 'communicate; order; testify'; Skt. *krīṇāti* 'buys', OIr. *crenaid*; Skt. *grṇāti* 'swallows' (Burrow 1957:140); Ved. *punāti* 'cleans', cf. Ved. *pāvate* (Puhvel 1960:21ff.).

Examples of Root-2-3:

*-(*e*)*ṣ-kh-*:

Hitt. *pešk-*, iter. of *pai-* 'give'; *nešk-*, iter. of *nai-* 'lead'; *aršk-* 'attain' (Hatt. II 13, KBo III 4 III 70; KUB XIII 2 I 25); Skt. *ṛ-cchāti* 'attains'; *icchāti* 'seeks', OCS *iskati* 'seek', OHG *eiscōn* 'seek, demand'.

Skt. *pr̥cchāti* 'asks'; Lat. *poscō* '(I) ask', *pāscō* '(I) herd, tend flocks', Toch. B *pāsk-* 'herd; preserve'.

Examples of Root-1-3:

*-*n-(e)kh-*:

Lat. *uincō* '(I) conquer', Osc. *uincter* 'conuincitur', Hitt. *ḫarnink-* 'annihilate', *ḫunink-* 'cut open, harm',²⁴ Avest. *mārənčaiti* 'harms, destroys' (**mṛ-n-ak-*: Kuiper 1937:125).

A one-rank stem structure can take an element from any of the three ranks. Examples of Root-1:

*-*n-* (see Kuiper 1937, Strunk 1972a):

Hitt. *tarna-* 'let, let go' (cf. Hitt. *taršk-* and *tarnešk-*), Toch. A *tārnā-* 'let' (cf. Toch. A *tār-k-*); Lat. *in-unt* 'they go' (-*n-* form from *i-* 'go', cf. Hitt. *iyannai-* 'constantly go').

Examples of Root-2:

*-(*e*)*s-*:

Hitt. *lukkeš-* 'shine', Toch. *luk-s-* 'shed light'.

Hitt. *paḥš-* 'guard, preserve, observe', Lat. *pāstum*, *pāstor* (cf. *pāscō* 'herd, tend flocks'), Toch. A *pās-*, OCS *pasti*; Hitt. *paš-* 'swallow' (cf. Skt. *píbatī* 'drinks', Gk. *pōthi* 'drink' (imper.)).

Skt. *naiṣ-*, *neṣ-* (cf. *náya-* 'lead', Hitt. *nešk-*, *nai-* 'lead').

24. The Hittite form obviously goes back to a suffix sequence with the second element in full grade and phonetic repetition of the -*n-*; cf. forms without -*n-* before two consonants: *ḫar-nik-mi*, *ḫu-nik-ta*, and others.

*-(e)u-:

Gk. *keleúō* '(I) direct, move' (cf. *tel-eu-té* 'end': Schwyzler 1939:I.683, Chantraine 1968-:513); Gk. *orouō* '(I) attack'; Hitt. *tarḫ-u-* (*tarḫuzzi* 'conquers', evidently with zero grade of the suffix).

*-(a)H-:

Lat. *nouāre*, Gk. *neáo*, Hitt. *newahḫ-* 'renew'.

Hitt. *armahḫ-* 'become pregnant' (cf. *arma-* 'moon').

Examples of Root-3:

*-(e)ḱh-:

Toch. A *tār-k-* 'let go' (cf. Hitt. *tar-na-*, *tar-šk-*).

For Rank 3, in addition to the *-(e)ḱh- mentioned above, a number of other elements can appear; in traditional terminology these are described as extensions or root determinatives (*Wurzelerweiterung*). They include velar, dental, and labial elements: *-(e)k^ho-, *-(e)dh-, *-(e)th-, *-(e)gh-, and others (see Schwyzler 1939:I.701-6, Meillet 1938:237; for examples of most of these following a nasal of Rank 1 see Kuiper 1937:123-46).

These suffixes can be formally described in terms of rank structure, but reconstructing their original functions presents major difficulties, since they have many unrelated functions in the historically attested languages. For instance, the combination *-(e)ṣ-ḱh- acquires iterative-durative (Bechtel 1936) and plural-object (see I.5.5.6 above; also plural subject: Dressler 1968) functions in Hittite, causative in Tocharian (Couvreur 1938, Krause 1952), inchoative in Latin.

The same can be said of the Rank-2 suffix *-(e)s-, which variously yields aorists (Greek, Indo-Iranian (Elizarenkova 1960), Slavic; possibly also the -s past-tense forms of Hittite and Celtic: Watkins 1962), modal forms (the Indo-Iranian precative: Burrow 1954), desideratives (Puhvel 1960:41ff.), forms of the future (Greek, Indo-Iranian, Latin, Balto-Slavic), causatives (Tocharian).

In several languages (Hittite, Latin, Greek, Germanic), *-aH- forms denominal verb stems; a formally identical suffix can be found in Italic modal formations and in past-tense forms of Baltic and Slavic.

The suffixal combination *-n(e)u- has causative meaning in historically attested Hittite, traces of which can also be found in other languages; but in other Indo-European languages there is evidence for transitive-causative, intransitive, and perfect meanings (Kuiper 1937:202-28).

The diversity of meanings presented by the same suffixal elements in the historical Indo-European dialects indicates that these functions developed relatively late, within the individual dialects. The original general function of

these suffixes at the Indo-European level can be defined as word-forming: they were used to derive various verb stems with various lexical meanings. Subsequently, in the individual dialects, these lexical meanings changed to purely grammatical meanings, and the suffixes bearing them changed to carriers of relational grammatical meanings.

In the historical dialects this development of the suffixes toward markers of purely relational meanings brought about a reorganization of the original rank structure and new rules for the syntagmatic combination of the old suffixes. For instance, in Hittite the rank structure is essentially lost for those Indo-European verbal derivations that remained productive in Hittite, e.g. the inflectional suffix *-šk-* and the productive causative *-nu-* that can be added to any verb stem (in the following examples, numbers beneath forms indicate the ranks that the relevant suffixes had in Proto-Indo-European):

<i>uškišk-</i>	'look'	beside <i>ušk-</i> 'see' (root <i>au-</i>)
2-3-23		2-3

<i>duškišk-</i>	'rejoice'
2-3-23	

<i>šeškišk-</i>	'lie'
2-3-23	

<i>ḫatk-eš-nu-</i>	'afflict, oppress'
3-2-1-2	

A reconstruction of the earliest distributional patterns for these suffixal elements becomes possible only when archaic verb forms in the individual dialects can be compared and Proto-Indo-European verb forms set up by internal reconstruction.

6.5. Structural implications of the SOV type in the structure of Indo-European nominal constructions

6.5.1. *Preposed adjective constructions in Indo-European and their reflexes in phrases and compounds of the historical dialects*

According to the typological principles for OV languages discussed above, syntactic elements connected only with the nominal member of the OV syntagma are positioned before the O, on its free side. Consequently, in an OV language modifiers to the nominal part of the syntagma should be preposed. This is

precisely what we find in the earliest Indo-European adjectival and genitive constructions.

That the preposed position was the normal one for the ancient adjectival constructions of Indo-European can be determined by projecting compound lexical formations with adjectival components onto the syntactic level. In such compounds, the adjective generally precedes the noun. Typical examples of Proto-Indo-European date are Sanskrit modifying composites (*tatpuruṣa-*) of the type *karmadhāraya-*, which consist of an adjective + noun sequence: *mahā-devā-* 'great god' (Shiva), *priyā-sakhi-* 'pleasant (kind) friend', *svā-sthāna-* 'native land' (lit. 'one's own place'); Gk. *akrópolis*, lit. 'high city', *mesógaia* 'internal regions', *agriámpelos* 'wild grapevine'; Lat. *angiportus* 'narrow street, alley'; cf. Hitt. *šallakart-* 'big-hearted' (in the derived verb *šallakartai-* 'cause damage') (for compound types in Hittite see Kammenhuber 1961); cf. Goth. *armahairts* (beside Lat. *misericors*), OCS *milosrīdū* 'merciful', Russ. *polovod'e* 'high water' beside Lat. *palūs*, gen. *palūdis* 'swamp' (Trubačev 1972), and Slavic compounds such as *Svętoplūkū* 'Svjatopolk' (personal name).

The adjective + noun order proposed above on the evidence of these compounds is also supported by the structure of free phrases attested in the earliest Indo-European dialects: Hitt. *aššun šiwattan* 'good day' (acc.) beside the Sanskrit *karmadhāraya-* compound with the same roots: *su-dyūt-* 'having magnificent luster' (RV 140, 1; 143, 3; 643, 4); cf. forms in **(e)su-* such as *su-vīra-* 'hero' (lit. 'good husband'), OPers. *uv-aspa-* '(having) good horses', Gk. *hugiēs* 'healthy' ('well-living').

Cf. Old Hittite adjectival phrases such as *šu-up-pí wa-a-tar* 'clean water' (KBo XVII 1, Vs. I 14'); *ḪUL-lu ut-tar* 'evil deed' (*Tel.*, 2 BoTU 23 A I 33); *aššu IGIḪ.A.KA* 'your good eyes' (KBo VII 28 Vs. 11); *ḫa-tu-ga-uš la-lu-uš* 'terrible tongues' (KBo XVII I, Vs. II 11).

In Old Church Slavic, whenever it is free of Greek influence, we see the old preposed adjective ordering: OCS *vīś mirū* 'the whole world' as an equivalent of Gk. *kósmos* (Meillet 1951:386, 1934:§ 547), cf. Ved. *Viśvāmītra-* (personal name based on a compound etymologically identical to the Slavic one: Toporov 1968). Cf. also preposed **wikwa-* in reconstructed Indo-Iranian formulas such as **wikwā *aghār/*aghān* 'all days': Ved. *āhāni víśvā* (RV I, 52, 11), Avest. *vīspā ayārē* (Y 43, 2; Duchesne-Guillemin 1962:33); **wikwā *dhāman* 'all doings': Ved. *víśvā ... dhāma* (RV VII, 87, 2), Avest. *vīspanqm ... dāmanqm* (Y 1, 16); **wikwā- *wik-ā *wik-pati-* 'leader of all clans': Ved. *víśvāsām ... viśām pátiṃ* (RV I, 127, 8), Av. *vīspō vīso vīspatōiš* (Yt 16); cf. also *víśvā dvéšānsi* 'of all enemies' (RV IX, 111, 1), Avest. *vīspā tbaēšā* (Yt 10, 34) (Schmitt 1967:§ 382).

The normal ordering in Sanskrit adjectival phrases was adjective + noun. Phrases that are common to Indic and Greek consist of an adjective and a following noun, e.g. Ved. *iṣirēṇa ... mānasā* 'with holy manas' (RV VIII, 48, 7),

Hom *hieròn ménos* 'holy strength' (Odyssey 18.34) (Schmitt 1967:§§ 42, 43, 192); Ved. *purū dānsāṁsi* 'abundant art' (RV V, 73, 2), Gk. *poludēnea · polúboulon* 'penetrating' (Hesychius) (Schmitt 1967:§ 308); Ved. *āsúm ... sūryam* 'fast sun', Gk. *ōkéos Ēlíoio* (Mimnermos, fr. 11.5.D) (Schmitt 1967:§§ 319, 320); Ved. *urú ... sádas* 'spacious place' (RV I, 85, 6), Gk. *euuodéiēs* (Iliad 16.635) (Schmitt 1967:§ 511).

Common to Illyrian as well as Indo-Iranian and Greek is the compound **wesu *klewes* 'good fame': Ved. *vásu-śravas-* (RV V, 24, 2), Avest. *vanhāu sravahū* (Y 30, 10c), Gk. *eukleēs*, Illyr. *Vescleves* (Schmitt 1967:§§ 143, 146, 179).²⁵

The adjective is preposed to the noun in the majority of Proto-Indo-Iranian formulas: e.g. **Jiwas *asus* 'living spirit': Ved. *jīvá ásur*²⁶ (RV I, 113, 16), Avest. *Juyō aṇhuš* (H. 2, 2); **draugha- *wačas* 'lying word': Ved. *dróghāya vácasa* (RV VI, 62, 9), Avest. *draoγam vāčim* (Yt 19, 33) (Avest. *draoγō.vāxš-*, Ved. *droghavác* represent a compound from the same phrase); **surām *madhu* 'wine-beverage honey': Ved. *surām mādhu* (AV X, 6, 5), Avest. *hurayā vā maδōuš vā* (Vd 14, 17); **gharanya- *mani* 'golden talisman': Ved. *hīraṇyena maṇinā* (RV I, 33, 8), Avest. *zaranyō.minam*²⁷ (Yt 15, 57, cf. 14, 33); **danstra- + *warağh-* 'tusked boar': Ved. *áyodan-ṣṭrān ... varāhūn*, Avest. *tiži.dqstrahe ... varāzahe* (Yt 10, 70); **satya- + *mantra-* 'true invocation': Ved. *satyó mántraḥ* (RV I, 152, 2), Avest. *haiθīm maθrām* (Y 31, 6).

6.5.2. Preposed genitives in Indo-European

The same preposed order is also typical of attributive genitives, for which the modifying word was normally placed before the modified. This order is still well preserved in Hittite and Sanskrit: cf. OHitt. *URUNešaš kurur eštu* 'may he be an enemy of the city of Nesa' (2BoTU 7, 24-25, Anittas inscription);

25. Since it has so many parallels, this word order is the original and basic one for Indo-European; the reverse order could have been an emphatic inversion, possible in poetic language (and probably finding additional support in the final position of adjectives used predicatively), cf. well-known examples such as Ved. *śrávo ... ákṣitam* 'unfading glory' (RV I, 9, 7), Hom. Gk. *kléos áphthiton* (Iliad 9.413); but cf. the opposite order in Ved. *ákṣiti śrávaḥ* (RV IX, 66, 7) (Schmitt 1967:§§ 2, 101) and Gk. *áphthiton húdōr* 'inexhaustible spring' (Hes.; Wüst 1969); cf. Ved. *urugāyám ... śrávo* 'wide ... fame' (RV VI, 65, 6), Skt. *Uruśravas-* (in the Puranas), Celt. *Verucloetiús* beside Hom. Gk. *kléos eurú* (Odyssey 1.344) (Schmitt 1967:§ 115); cf. also Hitt. *pattar-palḫi-* 'broad-winged'.

26. For this Sanskrit word and its lexical combinability see Schlerath 1968; it corresponds etymologically to Gmc. **ansuz* 'sovereign god' (Polomé 1953, 1970), cf. Hitt. *haššu-* 'king' < **Hṣeu-* (Ivanov and Toporov 1974:132), *hašawa-* 'priestess', *haš-* 'give birth'.

27. In compounds such as Ved. *cakrām hīraṇyáyam* (RV VI, 56, 3), Avest. *čaxra zaranaēna* (Yt 10, 136), the word order is inverted; cf. the archaic normal order preserved in compounds: Ved. *hīraṇya-cakrān* 'golden-wheeled' (RV I, 88, 5), Avest. *zaranyō.čaxra-* (Yt 15, 57).

URUNešaš KITÚĜĤI.A URUNešaš TÚĜĤI.A *ti-ya-mu* 'bring me cloth of Nesa, cloth of Nesa' (BoTU 14, 13); LUGAL-an *a-aš-ka* 'to the gates of the king' (KBo VI 3 III 63); LUGAL-aš ĠĠR-ši 'to the king's feet' (KBo XVIII 1 IV 28), LUGAL-(w)aš SAL.LUGAL-(aš)ša *iššaz-mit* 'from the king and queen's mouth' (KBo XVII I 18). Cf. also Hitt. *ag-ga-an-na-aš* *Ti-an-na-aš* *UN-aš eš* 'be a person of death (and) life' (KBo IV 14 III 9).

The order with genitive determiner preceding the determined noun is reconstructed for a number of Proto-Indo-Iranian forms, some of which have correspondences in Greek and elsewhere:

Indo-Iran. **sū(r)ya(sya)* **čakra* 'wheel of the sun': Ved. *sūryasya* ... *cakrām* (RV V, 29, 10); Gk. *hēliou kúklos* (Aeschylus, *Prom.* 91); Oícel. *sunnu* ... *hvél* (Schmitt 1967:§§ 324-32; cf. Ivanov and Toporov 1965:135, 230; 1974:22); Ved. *Divás nápātā* 'sons of heaven' (= 'of god'), which in the etymology of its first element and the meaning of the second corresponds to Gk. *Dioskoúroi* 'Dioscuri' (the sons of Zeus, god of the clear sky, cf. Homeric hymn no. 33), Lith. *Diēvo sūnēliai* 'sons of God', Latv. *Dieva dēli* 'children of God' (Ward 1968, Ivanov 1972, Ivanov and Toporov 1974:20). Also belonging to this type in the etymology of its first member is Gk. *Dioklēs* (Iliad 5.542), Ved. *Devásravā* (RV III, 23, 2), *devásya śrávasā* 'glory of god' (RV IX, 70, 2) (Schmitt 1967:§ 134); related to the type *Divás nápātā* in the etymology of its second element is Indo-Iranian **apām* **napāt* 'grandson of the waters', reconstructed from Ved. *apām nápātam* (RV II, 35, 3), Avest. *apqm napā* (Schmitt 1967:§ 577). Cf. also the Proto-Indo-Iranian formulas **ṛtasya* **path(an)-* 'path of truth': Ved. *ṛtasya pathā* (RV X, 31, 2), Avest. *ašahyā* ... *paθō* (Y 51, 13); **ṛtasya* **wağhas-* 'wheel of truth': Ved. *ṛtasya vāhasā* (RV VIII, 6, 2), Avest. *ašahyā važdrēng* (Y 46, 4), *ašavazah-*; **kšaitrasya* **pati-* 'lord of settled place, home field': Ved. *kṣétrasya pátiḥ* (RV IV, 57, 3), Avest. *šōiθrahe paitīm*. Further evidence for the ancient preposed genitive can be drawn from the genitive in *-s-yo, since by Wackernagel's Law the -yo element had to be in second position in the syntagma.

From Vedic cf. also *bhúvanasya nābhiḥ* 'navel of the world' (RV I, 164, 35), *devákṛtasya rájā* 'king of the god-created'.

This ordering of elements in genitive constructions can also be seen in the first element of determining compounds such as *nṛ-pati-* 'lord of men', *bhū-pati-* 'lord of earth' ('king'), *artha-pati-* 'lord of things', *tat-puruṣa-* 'his person' (= 'his servant'). These are transforms of genitive-plus-modified-noun combinations. The order of elements in this type of compound reflects the original syntagmatic order of elements in an attributive complex (see Benveniste 1974:241ff.).

The preposed modifier in Indo-European attributive constructions is also reflected in ancient compounds of the Sanskrit *bahuvrīhi* type, which can be regarded as transforms of preposed determining clauses (Jacobi 1897:83ff.):

ūrdhvā-bāhu- 'one who raised the hand', *divyā-rūpa-* 'having divine appearance', *mahātman-* 'great-souled', *mahā-bhāga-* (epic Sanskrit) 'having a large portion, large-portioned', *mahā-yaśas-* 'having great fame', *bahú-vrīhi-* 'having much rice' (Benveniste 1974).

The same type also includes compounds like Gk. *rhodo-dáktulos Eōs* 'rosy-fingered Dawn', *polúmetis Odusseūs* 'Odysseus of many minds', *megá-thumos* 'courageous, daring', Lat. *auri-comus* 'golden-haired', *sicc-oculus* 'dry-eyed', *magn-animus* 'great-souled', and others.

6.5.3. *Preposed relative constructions in Indo-European. Relative particles as determiners*

Since modifiers were preposed in compounds and hence presumably also in free constructions in Indo-European, relative clauses must also have been preposed to their antecedent.²⁸ This preposing of a complex modifier is attested in Hittite relatives, and to some extent in other Indo-European dialects.

Cf. OHitt. *nu ku-iš DUMU.SAL ḫa-an-te-iz-zi-iš* 'and which daughter (of the king) is first' (*Tel.*, 2BoTU 23 A II 38, § 28, II 38-39); *kuiš dan pedaš DUMU* 'a son who is of the second rank'; *ku-iš ša-ga-i-iš ki-i-ša-ri ta LUGAL-i SAL.LUGAL-ya ta-ru-e-ni* 'whose prediction comes true, (about him) we speak to the king and queen' (KBo XVII 1 + Rs. IV 9).

Cf. Old Russian constructions like *kotorymi rĕkami sudy xodjat*, *i na tĕx* 'rĕkax' ... *plotin* 'ne delati' 'on which rivers boats travel, on those rivers dams are not to be built'; cf. Lat. *pecuniam quis nanxitur, habeto* 'money (the one) who finds, let (him) keep (it)'; cf. also Hitt. *kuiš paprizzi* 'who defiles' ('the one who defiles'); in Osco-Umbrian: *pīs ceus Bantins fust* (T.B. 19) 'who will have been a Bantian citizen', *píd eíseí thesavreí ... eestit* (C.A. 51-52) 'whatever exists in this storehouse'.

In Latin and Osco-Umbrian, constructions with indefinite relative pronouns (*relativa indefinita*, Wackernagel 1924:66-67) are identical, which gives reason to believe that there must have been a preposed relative in Italic.²⁹

The change of OV to VO order in several Indo-European dialects (Greek, Latin) brought about a shift of preposed relatives to postposed relatives with the relative pronoun **khois* (in Celto-Italic, Tocharian, and Anatolian) or **yo-* (Gk. *hos*, Indo-Iranian *ya-*, Balto-Slavic, Phrygian), i.e. to the type that is common throughout the historical Indo-European dialects (see Schmitt-Brandt 1973).

28. Kuno 1974, based on the hypothesis that center-embedded structures are difficult to process, gives theoretical reasons why relative clauses precede main clauses in SOV languages.

29. Given these facts it is possible to raise the question of whether constructions like Goth. *hvas þiudans* 'who is king' are archaic; previously they have been regarded as Gothic translators' reanalyses of Greek originals (A. Sturtevant 1947).

But there is evidence for earlier use of **khois* and **yo-* in these dialects, in constructions with preposed **khois*, **yo-* in nominal sentences: Gk. *hós még' áristos* 'who is far the greatest' (Iliad 16.271; Benveniste 1974, 1966a); *Teúkrós th', hòs áristos Akhaiōn* 'Theukros, best of all the Achaians' (Iliad 13.313), *hós k' epideuēs* 'the needy man' ('who is needy') (Iliad 5.481); cf. Vedic Skt. *yé jánitvāḥ* 'who are to be born' (RV IV, 18, 4), *yé ca devā ... yé ca mártāḥ* 'and which are gods and which are mortals' (RV II, 27, 10) (Benveniste 1974, 1966a); cf. Avest. *azəm yō ahurō mazdā* 'I who am Ahura Mazda' (Y 19, 6), *tqm daēnqm yā hātqm vahištā* 'this religion, which is the best of those that exist' (Y 44, 10).

In such constructions the relative pronoun is already functioning as a definite article (Benveniste 1974:233ff.). The relative pronoun as an article also appears in Hittite in postposed position. Whether Hitt. *kuiš* is functionally a relative pronoun or a definite article is shown by respectively preposed or postposed order: *kuiš paprizzi* 'whoever (indefinite) defiles' but *paprizzi kuiš* 'the defiler' (Held 1957; see Schmitt-Brandt 1973); cf. *armauwanteš kuieš nu-za apiya UL ḫaššiyanzi* 'and those who are pregnant will not give birth at that time' (Telepinus myth, KUB XVII 10 I 14f., Ivanov 1965:240).

Postposed usage of the relative pronoun as definite article is found in Indo-Iranian³⁰ and Balto-Slavic (see Rosenkranz 1958a): Ved. *sā rātrī páritakmyā yā* 'that night, the waning (one)' (RV V, 30, 14). In Balto-Slavic the determiner **yo*, which had not yet become a relative (Van Wijk 1935), fused with a preceding adjective to yield the definite adjective: OLith. dat. sg. masc. *giwamū-jem*, nom. sg. fem. *antroia*, *cziszcziausaija*, *paschlowintoie panna* (Zinkevičius 1957:90, 1958:51-52, Stang 1966:271-74, q.v. for analogous affixation of **jo-* to nouns in Old Lithuanian).

The ending *-ja* of Baltic and Slavic forms such as Russ. *dobraja* 'kind' (nom. sg. fem.) is identical to Skt. *yā* 'the one who' (see the Rigveda example above): Stang 1966:273. That the definite ('pronominal') adjectives were originally complex can easily be seen in Old Church Slavic forms like *dobrajego* 'kind' (gen. sg. def.) < *dobra* (gen. sg.) + *jego* 'of him, it' (Kuznecov 1953:149ff., 1959; cf. Wissemann 1957-1958, Flier 1974).

The same elements **-khoe-* and **yo-* were used in analogous syntactic functions as linking elements joining whole clauses or individual words:³¹ Hitt. *-ya-* 'and' (Rosenkranz 1973), Toch. *-yo* 'and', Myc. Gk. *jo-* (cf. Bader 1975a); Skt. *-ca* 'and', Myc. *-qe* > Gk. *-te*, Lat. *-que* 'and'; for the syntax of particles in

30. Possibly also in Celtic, cf. Gaul. *dugiiontiio* 'those who serve' (Thurneysen 1946:323, 364).

31. A typological parallel is the enclitic relative particle *-c* of Georgian (*romeli-c* 'which, who', *ra-c* 'which' [inan.], etc.), which also functions as a syntactic conjunction (*me-c* 'and I', *saxli-c* 'and the house'); for this Indo-European – Kartvelian parallel see Shimomiya 1973.

the sentence see below.³² Of the same origin are the ending of the Indo-Iranian and Greek genitive singular formative *-s-yo* in thematic stems: Skt. *-asya*, Gk. *-oio* < **-osyo* (see I.5.1.1 above).³³

The change of most attested Indo-European dialects from OV to VO triggered the gradual restructuring of attributive and relative constructions into the postpositive constructions that are regular for the VO type; these are already typical of most Indo-European dialects of the historical period, especially Greek and Latin, where modifying constructions are predominantly postposed.

6.5.4. *The structure of the old syntactic comparative constructions in Indo-European*

The OV order of the earliest stage of Indo-European is also evident in comparative constructions, where the standard of comparison is preposed (cf. Turk. *köpek kedi-den daha büyük* 'the dog is bigger than the cat', lit. 'dog cat-from is bigger'; Geo. *zayli k'ar'aze didia*, id., lit. 'dog cat-on is bigger' (see Jensen 1934, Kacnel'son 1949:226ff.). This construction, to be expected of earliest Pre-Indo-European as an OV language, can be traced in the historical Indo-European dialects:

Hitt. *nu-wa-kán A.NA ERÍNMEŠ.KA ERÍNMEŠ.YA mekki* 'and (compared) to your army mine is more numerous (bigger)' (Friedrich 1960, Benveniste 1948:115-43). Cf. also *namma-kan anzel huišwanni [natta] anzel išḫaš huišwatar nakki* 'further, in comparison to our life our lord's life is not more significant' (i.e. 'our life is no less important than the life of our lord', KUB XXXI 42 II 18-19); *iškiš-šet-ašta iškiši šalli* 'his back is great in relation to the back of the other' (i.e. 'is bigger than the other's back'), Bo 3263 I 23; cf. *ibid.* I 22, Puhvel 1973. Cf. Toch. A *maññāktaṣ lyutār lukśanunt šomaṃ* 'several (who) are brilliant from-the-moon' (i.e. 'brighter than the moon'): Thomas 1958.

Evidence that this construction was formerly widespread comes from Lat. *tē maior* 'bigger than you' and especially from archaic constructions in Vedic: *vācaḥ ghṛtāt* (abl.) *svādīyo mādhuṇaś ca vocata* 'say the word that is sweeter

32. **-kʰoe-* and **-yo-* as linking elements used with nominals are reconstructed for many Indo-European dialects (Gonda 1954, 1954a, Rysiewicz 1956:318-22); cf. Ved. Skt. *ca* as a coordinator of two nouns: *śatam ekam ca* 'hundred and one'. Common to Greek and Indo-Iranian is a construction with the first noun in the vocative and the second in the nominative plus **kʰoe*: Gk. *Zeūpāter ... Eēliós th'* '(O) father Zeus and Helios' (Iliad 3.276-77) (Wackernagel 1924:7).

33. In light of the sharings mentioned above, it is also interesting that in Australian languages such as Dyrbal the marker *ṇu* of a genitive or possessive nominal coincides with the ending of the verb in a relative clause (Dixon 1969). The same is true of Basque (Wilbur 1970:423). Cf. PIE **-yo* as a genitive ending and **-yo* in clauses like the Gaulish example *dugiōntiio* 'those who serve', mentioned in note 30.

than ('from') butter and honey (gen.)', lit. 'the word from-butter sweeter and from-wine, say' (RV VIII, 24, 20); *gaurád* (abl.) *védīyāñ avapānam índro* 'Indra who finds better water than a buffalo', lit. 'from-buffalo finding better water Indra' (RV VII, 98, 1; Delbrück 1888, Lehmann 1972b:985); OIcel. *sólo fegra* 'brighter than the sun', OE *sunnan beorhtra* id. (Lehmann 1972a:170-71, 1972c, 1974:31, 246).

The comparative construction with postposed standard as in Russ. *slasšče meda* 'sweeter than-honey' that is common in most attested Indo-European dialects is due to later restructuring of the OV type into the VO type characteristic of most of the dialects (Lehmann 1972a, b, 1974:238ff.).

(For word order typology of the clause and comparative constructions see also Andersen 1983.)

6.6. Internal syntactic relations within the OV and VO syntagmas

6.6.1. The origin of adverbs, postpositions, and prepositions in Indo-European

Above we analyzed the morphological and syntactic structures determined by OV vs. VO orders. OV order implies suffixal verb markers and preposed modifiers; VO order implies primarily prefixal verbal structures and postposed modifiers. Language types which are mixed in regard to these grammatical markers testify to structural change from one type to the other, where relic constructions reflecting the earlier syntactic type may be present.

Syntactic elements which are connected with both O and V constituents in the syntagma (unlike those connected with only one of them) should naturally be ordered between the two. They are the relational elements indicating syntactic connections between the two members of the syntagma. Symbolizing them with *p*, we have syntagma types OpV and VpO.

In the OpV phrase the relational element bears the grammatical function of postposition in relation to the O and preverb in relation to the V. On the other hand, in a VpO syntagma it has the function of adverb in relation to the V and preposition in relation to the O.

In the OpV construction we find exactly such relational elements, simultaneously postpositions to the nouns and preverbs to the verb: cf. Hitt. *I.NA URUKar-ga-miš an-da-an i-ya-aḥ-ḥa-at* 'into the city Carchemish I entered' (KBo IV 4 = 2BoTU 48, Vs. II 67-69); *na-an-kán A.NA LUGAL iš-ši-iš-ši an-da pa-a-i* 'and (he) gives it to the king, into his mouth' (KUB XIII 7 I 14).

na-aš-ta É-ir-za pa-ra-a pé-eš-ši-ya-an-du 'may they chase out of the house' (Tel., 2BoTU 23 B IV 18).

A.NA DUTUŠI pa-ra-a pí-iḥ-ḥi 'I give over to the king' (KUB XIV 1, Rs. 22).

IŠ.TU GÍR še-er ar-ḥa ku-ir-zi ‘and she cuts (them) off with a knife’ (KUB XXXII 115 + I 31).

nu-uš-ša-an A.NA 1Ma-ad-du-wa-at-ta še-er za-aḥ-ḥ[i]-ir ‘and they fought for Madduwattas’ (KUB XII 1, Rs. 59).

ku-iš-ki ku-ru-ra-aš me-mi-an pí-ra-an pé-e-ḥu-te-ez-zi ‘someone pronounces the word of enmity’ (KUB XXXI 44 II 6).

nu-uš-ma-aš-kán LÚIGI.NU.GÁL LÚÚ.ḪUB pí-ra-an ar-ḥa [pé]-ḥu-da-an-zi ‘and they lead a blind and stupid person before them’ (KBo VI 34 III 2).

NA₄p[í-ru-ni ka]t-ta-an še-eš-ta ‘and he slept with the rock’ (Ull., KUB XXXIII 98 I + 96 I + Bo 4746 I, 18).

In all these constructions the relational elements *anda(n)* ‘in, into’, *para* ‘out; ahead’, *šer* ‘concerning; above, on’, *piran* ‘forward’, *kattan* ‘together; under; with’ are simultaneously both postpositions to the nominal constituent of the phrase and preverbs to the verbal constituent.

In contrast to a language with the OpV structure, in one with VpO the relational element is a preposition to the nominal member and a postposed adverb to the verbal member. Such a language is English, in which constructions like *look at him*, *run away from him* contain the relational elements *at*, *away*, *from*, which are simultaneously prepositions to the nouns and adverbs connected to the verb. Cf. constructions like *whom do you look at?*, *whom do you run away from?*, and:

*I want the moon to play with
and the sun to run away with*

which is a transform of

*I want to have the moon to play with it
I want to have the sun to run away with it.*³⁴

From the schemas for languages with OpV and VpO given above it follows that if OpV changes to VpO in some language, then the -p- will change from postposition and preverb to preposition and (postposed) adverb:

OpV	⇒	VpO
postposition	→	{ preposition }
preverb	→	

Proto-Indo-European, an OpV language, had several relational elements that were syntactically both postpositions and preverbs, as is reflected most fully in the Old Hittite examples above. Further evidence is relic constructions in

34. Cf. Shakespeare's *bemocked-at stabs* (*The Tempest*, III iii 63).

individual languages such as Lat. *portā ab iit* 'went out of the door', which later became prepositional constructions (*ā portā* 'from the door').

That the restructuring of OpV to VpO that took place in the individual dialects had begun in Proto-Indo-European is indicated by Anatolian constructions with prepositions (contrast the postposition/preverbs above), e.g. Luw. *annan* 'under' in *an-na-a-an patanza* 'under the feet' (KUB XXXV 39 III 29), Lyc. *ēnē* 'under'; Luw. *šar-ri ka-ši-i ḫu-e-ḫu-i-ya* 'hurry for a visit', cf. the Lycian preposition *hrppi*. Some Hittite postposition/preverbs function as quasi-prepositions: *nu šara nepiši atti-ši ḫalzaiš* 'and to the sky, to his father he called up' (KBo III 7 IV 27; Goetze 1963:100); Hitt. *šer* functions as a preposition in a Hittite-Hattic bilingual about the moon god fallen from the sky: *na-aš-kán še-ir KILAM-ni ma-uš-ta* 'and he fell onto the market' (KUB XXVIII 3 + XXVIII 4 + XXVIII 5 I 11), but this is ascribed to the influence of the Hattic original (Kammenhuber 1955:115); cf. *ḫark- pe* 'hold, offer' beside the normal Hittite *pe ḫark-* 'hold' (cf. the preverb *pe-* in *peḫute-* 'take away, lead away', *pedaḫḫi* 'I carry away').

When OpV changes to VpO, the left valence place of the verb is freed and it becomes possible to join to it the prefixal elements that develop from old relational elements accompanying the verb, as well as from particles and pronominals. This is the explanation for the appearance, at a late stage of development, of the augment as a prefixal element on verbs in Sanskrit, Greek, and Armenian: Skt. *á-bharat* 'he carried', Gk. *é-phere*, Arm. *e-ber*. It also explains the Germanic prefix *ga-* in its uses to indicate aspect and future action (for the aspectual meaning cf. Lat. *com-*): Goth. *ga-þarban* 'refrain', *ga-daúrsan* 'dare', etc.; Lithuanian prefixal reflexives (*pa-si-klausýti* 'obey'), Slavic prefixed aspect forms (OCS *iz-baviti* 'save', *sū-dělati* 'make, do [perf.]'), and Irish forms with the prefix *ro-* (< **pro-*), corresponding functionally to Germanic forms in *ga-* (Kuryłowicz 1960, 1965b:245-47).

The relational elements themselves are historically independent nouns which only later became auxiliary grammatical relational elements. This origin is clear from the fact that Old Hittite postposition/preverbs functioned as neuter nominals with possessive pronominals indicating inalienable possession:

MUŠENḫaran[an] ERÍNMEŠ-an-a LUGAL-aš SAL.LUGAL-ašš-a *šer-šemet waḫnumeni* 'we wave the eagle and the warrior over them (lit. 'wave their top'), over the king and queen' (KUB XVII 1 II 34, 40, 46, III 35).

šer-šet-wa šarnikmi 'I will compensate for it', lit. 'I will compensate its top' (Hittite Laws, § 95).

[*pí-*]ra-am-mi-it ku-un-na-az e-ša-ri 'before me to the right he sits', lit. 'to my front on the right' (Anittas inscription, KBo III 22 I 79 + KUB XXXVI 98 b, Rs.).

pí-e-ra-aš-še-et GIŠzupari ḫarzi 'before him (lit. 'to his front') he holds a torch' (KUB XVII 1 I 32f.).

6.7. The structure of the simple sentence in Indo-European

6.7.1. Left and right syntactic components of the sentence and the rank structure of the left component

The structure of the Indo-European sentence core analyzed above can be represented as S O' O p V, where O' and O are respectively the indirect (dative) and direct (accusative) objects. This entire structure represents only the rightmost part of the simple sentence. The left component of the sentence is a chain of particles having various functions and connected to the units of the right component. Each of these two components of the Indo-European simple sentence can be regarded as a sequence of cells with one element in each cell. Thus the right component can be shown as in Table 2.

Table 2
Right component of the Indo-European sentence

S	O'	O	{p}	V
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The left component also consists of a sequence of cells, each bearing a particular syntactic relation to the appropriate element of the right component.

The leftmost element in the left component is one of the particles **nu/*no*, **tho*, **so*, **e/*o*. The reconstruction of these particles for Indo-European is based on the functional correspondence of etymologically identical particles in various Indo-European dialects: OHitt. sentence-initial *nu*, OIr. *no-* initially in the verb complex (which was sentence-initial): Hitt. *nu-mu DIŠTAR ... kaniššan ħarta* 'and Ishtar loved me' (Hatt.), OIr. *no-m Choimmdiu-coíma* 'the Lord loves me' (Watkins 1962a:114, 1963a:13). Middle Welsh *neu-*, cognate to OIr. *no-*, serves to introduce main clauses (and has no clear meaning): Thurneysen 1946:348, § 538. Cf. Lith. *nu-* initially in prefixed reflexive verbs, Toch. *ne-* initially in verb complexes such as Toch. B *nesām* '(and) they are' (see Bader 1975b); Slavic **nŭ* (OCS *nŭ*, Russ. *no*, Serbo-Cr. *nŏ*), sentence-initially and usually meaning 'but'; also Gk. *nŭn*, Lat. *nunc* 'now', OCS *nyně* 'now'.

The initial — leftmost — position can also be occupied by **tho* and **so/*su*, functionally equivalent to **no/*nu* and therefore in complementary distribution with it:

OHitt. *ta-šši pai* 'and he gives him' (Hittite Laws, § 47 A), *ta-an ištarnikzi* 'and will make him sick' (Hittite Laws, § 10); *ta-aš-ta e-di na-at-ta ne-e-a-ri* 'and then it (mountain) does not incline in the other direction' (KBo III 40 (+ KBo XIII 78 Vs.), Vs. 13'), cf. Hom. Gk. *tó: tò dè kai tetelesménon éstai*

(Iliad 1.212) 'and here is what will happen'; OCS *to: to že mličati jemu nužda bēaše* 'it was necessary for him to keep silent' (Supr. 240.5).

Hitt. *ša-* 'and': DĪD-*ya pa-it ša-aš pār-ku-e-eš-ta* 'and to the river he went, and he cleansed himself' (KBo VIII 42, Rs. 9); *ša-an iš-pa-an-di na-ak-ki-it da-a-aḫ-ḫu-un* 'and him I took by force at night' (KBo III 22 47-48); *še-a e-ki-ir* 'and they died' (KBo III 38, Rs. 29') (see Gamkrelidze 1957); Myc. Gk. *o-* = *ho* < **so* in combinations like *o-de-qa-a₂* = *ho de qu(e) aha*, cf. Gk. **ho de te* (PY 304 = On 300, Ventris and Chadwick 1973:423-24); the combinations with enclitics are identical in Gk. *hóte*, Ved. *sá ca*, OIr. *se-ch* < **so* + *khoe* (Watkins 1962a).

Cf. the analysis of Slavic forms such as *sem(ka)* 'and this I ...' (Issatschenko 1970:189-203).

The particle **e*/**o* has similar functions, occupying the same position in the sentence and thus belonging to the leftmost cell. Cf. Luwian sentence-initial *a-*: *a-an tiyammaššiš DUTU-za darawiddu* 'and may the earthly sun strike him' (Laroche 1959a:147).

Cf. Risch's interpretation (1967) of initial *o-* in Mycenaean: *o-di-do-si du-ru-to-mo* = *o didónsi drutómoi* 'and the woodcutters give' (PY Vn 10).

Cf. Slavic *o-* and *e-* with following pronominal enclitics: **e-to*, Russ. *è-to*, from **i to* 'and that' (cf. Hitt. *na-at* 'and that') (Issatschenko 1970:194-95); cf. sentence-initial *o to* ..., *o se* ... (Russian Primary Chronicle *sub anno* 970): *vo to vy est* 'there you are' (Issatschenko 1970), which is the source of Russ. *von* 'over there', *vot* 'here'.

Thus the leftmost position in the left component of the Indo-European sentence was occupied by one of the elements of the cell [**nu*/**no*, **tho*, **so*, **e/o*]. This cell was followed by a series of cells with pronominal elements marking subject-object relations. These appeared in the same order as the arguments in the right component of the sentence (where they were full words): subject pronoun + indirect object (dative) pronoun + direct object (accusative) pronoun. This order is best preserved in Hittite (Friedrich 1960); there are some changes in other Anatolian languages and some of the other Indo-European dialects. The pronominal elements reconstructed for the third-person singular are **-os-* (nom.), **-oth-* (nom.-acc. neut.), **-se-/ *-si-* (dat.), **-om-* (acc.): cf. Hitt. *na-aš-ši* 'and he to-him', *na-aš-an* 'and he him', *na-aš-ši-at* 'and he to-him it'.

The object particle distinguishes person: 1sg. **-m-*, 2sg. **-th-*: cf. Hitt. *nu-mu* 'and me', *nu-tta* 'and you', *na-aš-mu* 'and he me', *na-aš-ta* 'and he you'. We find the same correspondence in Old Lithuanian formations: *Pa-mi-sakay to mi gayl* (Stang 1966:253); cf. Slavic **mi*, **ti*, **si* in constructions such as *sem(ka)* 'and it I', Russ. *avos* 'perhaps' < **a + o + sī* 'and it to-him' (Issatschenko 1970); OIr. *no-m* ... *coíma* 'and me ... he loved', *no-t erdarcugub* 'and you I will make famous'; Vedic enclitic pronouns *me*, *te* (Thumb and Hauschild 1959:II.125);

Gk. *moi, mou, me; soi, sou, se* in the enclitic or proclitic position characteristic of other Indo-European syntactic elements and described by the Vasil'ev-Dolobko formula: Enclitics are also proclitics (Dybo 1971; cf. Jucquois 1970).

The rightmost cell in the left component was occupied by the particles **khom, *som, *photh*, which had aspectual or local meanings: cf. Hitt. *-kan* < **khom*, *-šan* < **som*. Hittite *-kan* marks completion of action, while *-šan* marks telicity of a goal-directed action (Josephson 1972); cf. comparable aspectual meanings in etymologically identical elements: Goth. *ga-* (perfective aspect), OLat. *com-, con-* (e.g. *condō* 'I construct'); cf. Slavic **sū-* in the meanings of perfective aspect and telicity.

For the Proto-Indo-European nature of **-photh*, cf. Hitt. *-pat* in the meaning of an identifying and emphatic particle: *ut-ne-e* [*ku-it k*]*u-it-pāt a-ra-iš* 'whatever country revolted' (KBo III 22, 11-12, *Anittas*); cf. OPers. *patiy* 'also', Toch. A *pat* in combinations like *kus pat* (cf. Hitt. *kuiš-pat*), *pat nu* (cf. Hitt. *nu-pat*), Lith. *pāt* in combinations like *nuō-pat* 'and also'.

In summary, the left component of the Indo-European simple sentence consisted of a sequence of cells filled by particles in a strict order.³⁵ The

35. This feature of Proto-Indo-European syntax was preserved and developed in Hittite and the other Anatolian languages. Based on the conclusions of Laroche and Friedrich, the following table can be constructed for Hittite (Hoffner 1973:521):

Table 3

Rank

1	2	3	4	5	6
<i>nu</i>	<i>-wa(r)-</i>	<i>-aš-</i>	<i>-mu-</i>	<i>-za-</i>	<i>-kan</i>
<i>ta</i>		<i>-an-</i>	<i>-ta-</i>		<i>-šan</i>
<i>šu</i>		<i>-at-</i>	<i>-du-</i>		<i>-(a)šta</i>
<i>-(y)a-</i>		<i>-e-</i>	<i>-ši-</i>		<i>-(a)pa</i>
<i>-ma-</i>		<i>-uš-</i>	<i>-naš-</i>		
			<i>-šmaš-</i>		

For the same data presented in terms of generative rewrite rules see Ivanov 1963:167-69. Only the second rank (represented in all the ancient Anatolian languages by particles like Hitt. quotative *-war-*) has no clear correspondents elsewhere in Indo-European and may be due to secondary development in Anatolian from constructions with a verb like Pal. *wer-* 'call', Hitt. *weriya-* (Gk. *elrō* < **wer-yō*, Lat. *uer-bum*, Ger. *Wort*, Engl. *word*, etc.); cf. the Russian particles *mol* 'it is said' < ORuss. *molvit* 'says', *de* 'it is said' < *deet* 'says', etc.

From a strictly synchronic point of view (Hoffner 1973), Rank 2 and Rank 5 are distinctive, since only in these ranks is there a choice of two possibilities (*-wa[r]-* vs. absence of quotative particle), while in the other ranks there are at least four forms.

Evidence for the relatively late character of Rank 2 in Anatolian is its semantics, since forms having to do with what Jakobson (1971b) calls *message about message* evolve in literary languages with a relatively well-developed system of narrative devices.

Rank 5 (reflexive: Hitt. *-za*, Luw. *-ta*) may be related to the particle **-dh-* with middle meaning found in verbal forms of several other Indo-European languages. The appearance of the reflexive particle **-th-* (Hitt. *-za-*, Luw. *-ti*) in Anatolian may have to do with the loss of subject-version and reflexive meanings in the middle conjugation. The meaning began to be expressed with a special particle in the initial part of the sentence; a trace of its old meaning can be seen in its

leftmost cell contained sentence-introducing particles, and the rightmost contained aspectual and local-emphatic particles. Between them appeared the elements marking subject-object relations, with the normal order of subject, indirect object, and direct object (see Table 4).

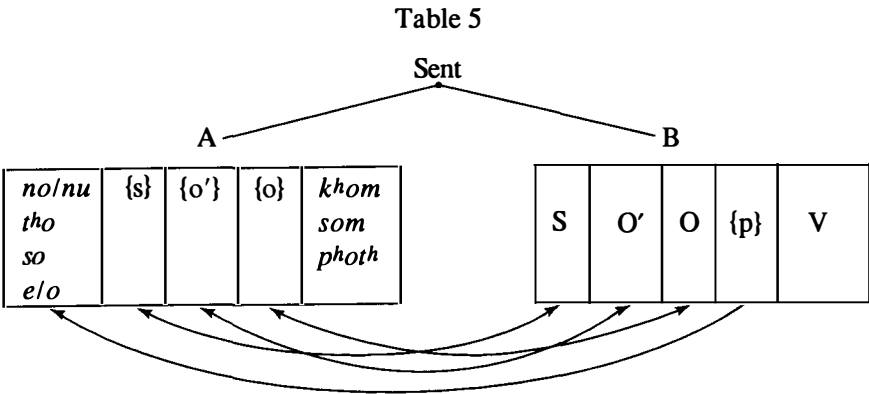
Table 4
Left component of the Indo-European sentence

<i>no/nu</i>	{s}	{o'}	{o}	<i>khom</i>
<i>tho</i>				<i>som</i>
<i>so</i>				<i>photh</i>
<i>e/o</i>				

- s Subject particle
- o' Indirect object (dative) particle
- o Direct object (accusative) particle

6.7.2. *The constituents of the Indo-European simple sentence and the interdependence of syntactic cells*

The simple sentence with its two basic components is expanded as shown in Table 5.



There is a complementary dependency between cells *s*, *o'*, and *o* of component A and the corresponding cells S, O', and O of B: they replace each other in sen-
use in Hittite to refer to possession by the object of the verb (Hoffner 1973). Note that reflexive *-za* is common in late Hittite but lacking in Old Hittite texts (see Otten 1953:60; see also Hamp 1984b).

tence structure, and the left and right member of any pair cannot both be present in the same sentence. The presence of one of them in the left part of the sentence implies its absence in the right part, and vice versa. In Table 5 these complementary dependencies are symbolized by two-headed arrows.

This interdependence of left and right cells is most clearly evident in Hittite, where enclitic pronominal particles replace adverbial subject and object arguments. When a subject or object is present in the form of an independent nominal, the corresponding pronominal particle is missing. Examples:

nu-kán ¹*Zi-da-an-ta-aš* ¹*Pí-še-ni-in* QA.DU DUMUMEŠ.ŠU *ku-en-ta* *ḫa-an-te-ez-zi-uš-ša* ¹IRMEŠ.ŠU *ku-en-ta* (BoTU 23 C I I 9) 'and Zidanta (S) killed Piseni (O) together with his children and main servants'. Contrast this with the following examples, which have pronominal enclitics with no independent subject or object arguments:

na-an-kán *ku-en-zi* (KBo VI 3 IV 27) 'and (he) kills him (-an)'; *ša-an* ^D*Ḫal-ma-š[u-it-ti]* ^D*Ši-i-uš-mi-iš* *pa-ra-a* *pa-iš* (BoTU 7, 16) 'and our god (S) gave it (-an) to Halmasuit (O)' beside DUMU-*mi* *la-ba-ar-ni* ^É-*ir* *pí-iḫ-ḫu-un* (BoTU 8 II 30) 'to my son Labamas (O) I gave a house (O)'.

Independent subject or object arguments and, duplicating them, their corresponding pronominal particles can be co-present in the same sentence only when the independent nominals are determiners or specifiers of the particles. In Hittite, as a rule it is a personal name that appears as such a specifying duplicate: OHitt. *ma-na-aš-kán* ¹*A-aš-ka-li-ya-aš* *ku-i-en-zi* *ša-an* A.NA ^É.EN.NU.UN *da-iš* (BoTU 12 A II 17) 'he, Askaliyas, could have killed [him] but put him in prison'; *ša-an* *at-ta-aš-mi-iš* ¹*Ki-iz-zu-wa-an* *na-at-ta* *ḫu-uš-nu-ut* (BoTU 10 18) 'and him (-an), Kizzuwas (O), my father did not leave among the living'; *ka-ša-at-ta-aš-ma-aš* ¹*Mur-ši-li-in* *pí-iḫ-ḫu-un* (KUB XXXI 115, 13) 'and you (-ta), Mursilis (O), I gave to them'.

The pronominal and nominal elements can each be regarded as zero when the duplicating element is present in the other half of the sentence. In a sense these are mutually conditioned zeroes. But there can also be unconditioned zeroes, if either *s*, *S* or *o*, *O* is absent. Unconditioned zeroes are most often *S*, less often *O*. These elliptical constructions are found in the various Indo-European dialects; examples from Hittite:

s, *S* = zero:

na-an-kán *ku-na-an-zi* *ša-na-ap* *a-ta-an-zi* 'and (they) kill him and eat him' (BoTU 21 II 4).

nu ^HUL-*lu* *ut-t[ar i-e-e]r* *nu-k[án* ¹*Mur-ši-li-in* *ku-(en-nir)]* *[(nu)]* *e-eš-ḫar i-e-er* 'and (they) committed an evil deed and killed Mursilis and shed blood' (Tel., BoTU 23 A I 33).

o, *O* = zero:

ta ḫarzi 'and holds' (= 'and holds him'; Hittite Laws, § 47A), *ta-šše pai* 'and gives to him' (= 'and gives it to him'; Hittite Laws, § 47A, cf. the Late Hittite duplicate text: *n-an-ši pai*).

6.7.3. Structural interdependence of syntactic cells and the transformational shift of right-component members to the left component

In the Indo-European sentence, the leftmost cell of the left component (the elements **nu/*no*, **tho*, **so*, **e/*o*) and the rightmost cell of the right component (the verb) were obligatorily filled. In other words, the verbal sentence had an obligatory verb as predicate and a marker of the beginning of the sentence taken from the leftmost cell. All other cells could be represented by zero markers (in the case of *s*, *o'*, *o* and *S*, *O'*, *O*) or be entirely absent (the cell containing **khom*, **som*, **photoh* and the *-p-* cell). Thus the leftmost and rightmost cells were a sort of structural skeleton for the sentence, which could be expanded into a more complex cell sequence by adding elements between the two extreme cells.

When not all cells of a sentence were filled, incomplete structures were formed in which the rightmost element, the verb, was adjacent to elements from one of the internal cells or, when no intermediate cells were filled, the initial one. This structure is illustrated by sequences of leftmost cell element plus verb, e.g. OHitt. *numaltahhun* 'and I prayed' (*Anittas*, KBo III 22, Rs. 59), *nuhuwar[tahhun]* 'and I cursed' (*Anittas*, KUB XXVI 71, 7).

These combinations of initial element and verb could ultimately fuse into complex verbs with prefixes. Note that *nu-* — a marker of the beginning of the sentence in Old Hittite — is written as one word with a following verb (Ottén 1953:60ff.). This is apparently the origin of prefixal imperfects in Celtic (Old Irish): *no-téigmis* (1sg.), *no-feidtis* (3pl.) (Thurneysen 1946:371); cf. Old Church Slavic combinations such as *ny-imatŭ* (John 3:16, 8:12; Vaillant 1948, 1952:55, 409), Russ. *nó čtu*, *tó tvorju* (Čudovskij New Testament; see Dybo 1971).

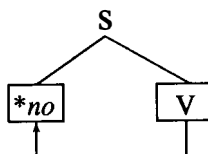
Presumably of similar origin are the augmented verb forms of the early Indo-European languages. The prefixal augment **e-* is the result of fusion of sentence-initial **e/*o* with an immediately following verb: Gk. *é-phere*, Skt. *á-bharat* 'brought', Arm. *e-ber*, etc. (see 6.6.1 above, and Watkins 1962:113, 1969:40).

When the verb immediately followed **khom* or **som* (i.e. the rightmost cell of the left part of the sentence), fused verb forms could arise with **khom*, **som* as prefixes. This is apparently the origin of Latin forms with the preverbs

com-, *con-* such as OLat. *condō* 'I erect', cf. Hitt. *-kan + dai-*; forms with the preverb *ga-* in Gothic;³⁶ and forms such as Skt. *sam-dhā-* 'agreement', OCS *sqdŭ*,³⁷ cf. Hitt. *-šan + dai-*, Ved. *sám aranta* '(they) ran together, came together' (= 'were healed') (RV IV, 19, 9), OIcel. *saman runninn*, id. (Schmitt 1967:§ 55) beside Hitt. *-šan + ar-* in combinations such as MHitt. LÚKÚR-*šan kuedaš* [*hud*]ak aršakizzi '(a city) into which the enemy immediately enters' (KUB XIII 2 III 23, Instructions to leader of border detachments); *kuedani-ma-ššan URU-ri EGIR-pa arti* 'from (the) city which you come back to' (ibid., III 29). Cf. also Skt. **sam + vid-*: Ved. *pitṛbhiḥ ... sam-vid-* 'meeting with one's ancestors (in the afterworld)' (cf. the etymology of *Aida*: *Aídēs* < *áwid-* < **sm-wid-* (Schmitt 1967: § 86), unless it is from **ŋ-wid-*) beside Slav. **sŭ- + *vid-* in Russ. *svidet'sja* 'meet', etc.

Also a structural feature of the Indo-European simple verbal sentence is the verb-initial construction. Such constructions were produced by a reordering transformation whereby the verb was moved from the rightmost to the leftmost cell in the sentence, where it took the place of the sentence-initial markers. This is shown in Table 6.

Table 6



The transformation yields a new inverted sentence structure with the verb in initial position, followed by the other elements in their usual order. However, the verb could be followed by a linking element **-yo* or **-khoe* 'and',³⁸ which took over the function of marking the beginning of the sentence from the elements of the first cell displaced by the verb. This inverse sentence structure is reflected in many early Indo-European dialects, e.g. OLat. *dant-que eum* 'and they give it', Hitt. *kišat-ya-za* 'and became', Gaul. postverbal *-yo* as in *dugiiontiio* (Thurneysen 1946:528).

36. Since Hittite *-kan* was both a perfectivizer of verbs and one of the local preverbs, both of these functions can be considered archaic in Germanic. For the perfectivizing function of Goth. *ga-* see Guxman 1966 (which extends V. Streitberg's views); for its local use see J. Lindemann 1970.

37. Descendants of **khom*, **som* in combination with a following object are the Slavic prepositions *kŭ*, *sŭ* in fused combinations like *kŭnemŭ* 'to him', *sŭnemŭ* 'with him', etc.

38. Hittite *-ma* appears particularly often in this function: *da-at-ta-ma-at* 'he already took it' (money) (Ras Shamra 17, 109, recto 4); *warpanzi-ma-wa-šmaš UL* 'but they do not wash' (KUB XVI 34 I 28), *unnanzi-ma-war-aš nawī* 'but they have not yet driven them away'.

To judge from the syntactic data of the ancient Indo-European dialects, the inversion transformation also affected the -p- element, shifting it to the initial cell to replace the sentence-initial markers (see Table 6). When this occurred the initial -p- could be followed by a substitute initial marker *-yo or *-k^hoe, as in Hitt. *appa-ya-kán natta kuitki peššiyazzi* 'and there he throws nothing away' (KUB X 93 IV 2), *šer-a-šan šA GIŠ LÚIŠ artari* 'and on it a wagon-driver of wood stands' (KBo V 1 II 49).³⁹ This shift of -p- to sentence-initial position explains constructions with tmesis such as Lat. *sub uos placō* 'I pray you' = *supplicō uos*; *prae tet tremonti* (see Watkins 1962a).⁴⁰

In addition to the shift of right-component members to the leftmost cell, emphatic shifts of S, O', and O to the leftmost cell can also be posited. Examples of such shifts, with emphatic stress, are common in Old Hittite: e.g. *zik-wa* UR.BAR.RA-*aš kištat* 'and you became a wolf' (Hittite Laws, § 37), with S shifted; *kuit-wa-šši kuit eššaweni* 'whatever we do to him' (HT), with O shifted; *GIŠlu-ut-ta-an-za-at tar-na-u* 'may (he) let (it) out the window' (KUB XIII 10 IV 10); cf. also *da-an-ku-wa-ya-ša ták-na-aš KAS-an pa-id-d[u]* 'and via the dark earth may he go' (KUB XXXIII 3 III 6), with O' shifted.

The structure of the Indo-European simple sentence is best preserved in the Hittite sentence, which is an expanded model of the Proto-Indo-European sentence pattern. Other Indo-European languages, e.g. Celtic, preserve only fragments of the general structure. In Hittite the left-hand sentence component inherited from Indo-European is made more complex by the addition of new, specifically Anatolian, particles (e.g. the quotative Hitt. -war-, Luw. -wa, the reflexive Hitt. -za-, Luw. -ti, etc.; cf. also the corresponding enclitics in Ancient Greek). The left component of Hittite is a long chain of particles in which grammatical relations are synthetically marked on the verb in a way typical of

39. Cf. Hitt. -ma- with the same function as -ya- in sentences like *para-ma-aš-šan natta kuitki nai* 'but he adds nothing' (KUB X 93 IV 1).

40. Presumably also produced by such shifts are Ossetic (Digor dialect) constructions with pronouns and particles ordered between preverb and verb:

æra-sæ-farsta
Pvb them asked
'(he) asked them' (Pvb = preverb)

is-min-æj-ğær kodtaj nur
Pvb me it voice 2sgPast now
'did you tell me this now?'

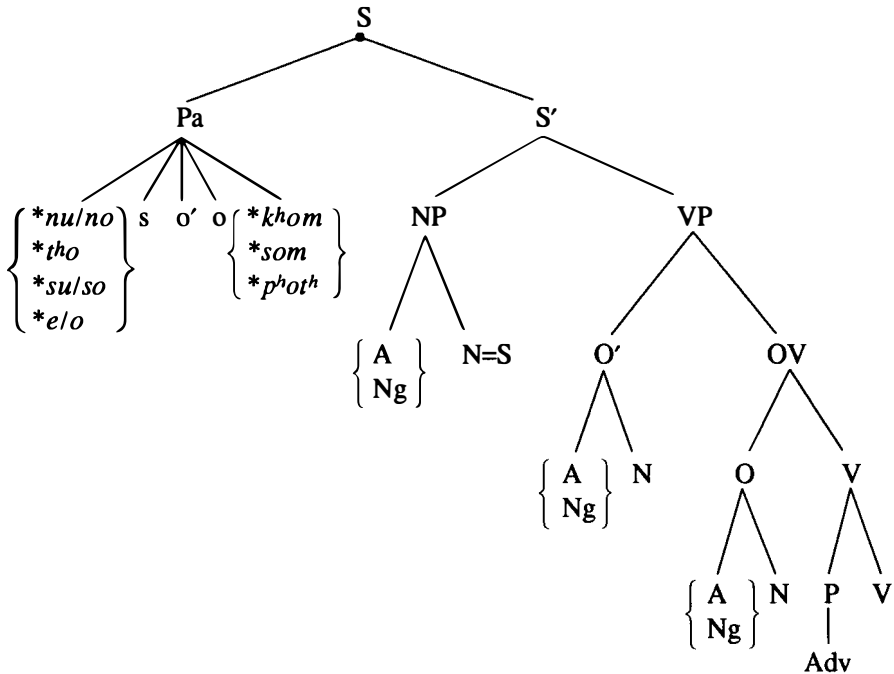
(See Miller 1962:136; also Schmidt 1970:166.) The resultant Indo-European dialect structures find a typological analog in Kartvelian constructions with tmesis, e.g. Old Georgian:

tkwen še-ara-xwalt
you out not go
'You will not go out' (see Schmidt 1969: 96ff.)

polysynthetic languages.⁴¹ Thus the attested type of the Hittite sentence stands for the structure of the simple sentence posited for Proto-Indo-European.⁴²

The structure of the Indo-European sentence can be shown in the form of a dependency tree, as in Figure 6:

Figure 6



The sequence $\left\{ \begin{array}{c} A \\ Ng \end{array} \right\} N$ under O' can be an absolute construction, which bears a syntactic relation to the entire sentence and therefore in the linear projection appears at the extreme left of the right component of the sentence.

41. Cf. Hittite chains like (1)*nu*-(2)*war*-(3)*aš*-(4)*ši*-(5)*za-kán* '(1) and (2) quotative (3) he (4) to him (5) for himself'.

42. A close typological analog to the Hittite and Indo-European sentence is found in languages of northern Australia, where particles marking subject-object and certain other relations immediately follow the first word in the sentence; that word is most often an empty carrier of particles and has no independent meaning. An example is Djinba *ba-ndjan garm-e* 'and-they go', an exact parallel to Hitt. *n-at panzi*, id. For these constructions see Capell 1972:14-18, also Dixon 1972; it is interesting that in the same languages (e.g. Dyirbal) genitive and relative constructions are related (Dixon 1969), another typological parallel to Indo-European. Finally, it is precisely among the Australian languages that we find the closest analog to the Proto-Indo-European active structure (first observed by Kacnel'son 1967).

Section Three

The Areal Organization of Proto-Indo-European

Chapter Seven

The differentiation of the Indo-European linguistic region

7.1. The formation of the historically attested Indo-European dialects

7.1.1. Principles for determining isoglosses of various time depths for determining dialect subdivision. The dialect divisions of Proto-Indo-European

In studying the subdivisions of the Indo-European speech community and establishing the connections among individual dialects which show that they developed together during a certain period within a certain historical area, special attention must be given to shared phonological, morphological, and lexical phenomena, known as *isoglosses*. Isogloss bundles are a clear indication that dialects evolved together within a protolanguage or after its breakup. Areas distinguished by isoglosses presuppose shared innovations pointing to common development, while similarity in preservation of archaic traits is not an indication of common development of the dialects.

For any single phonological similarity between separate languages that proves to be an innovation, it can always be asked whether it arose independently and separately in the two dialects simply because the sound change in question is inherently probable. If so, it cannot be regarded as an isogloss uniting the dialects and indicating common development.

For instance, a shift of *o* to *a* and the merger of *o* and *a* in various dialects of a language, or even the merger of *e*, *a*, and *o* into *a* (as in Indo-Iranian or Luwian), is a typologically probable phonetic process which cannot in general be regarded as an isogloss uniting any two related dialects. Analogously, palatalization of *k̑* to *č* in distinct dialects cannot ordinarily be considered an isogloss pointing to common development, since such a change is frequent and can arise independently in completely unconnected dialects (see Serebrennikov 1974:127ff.).

In general it can be maintained that in reconstructing ancient connections among dialects the occurrence of some phonetic change in different dialects is not sufficient justification for regarding the change as an isogloss joining the two dialects; all it can show is that the two dialects may have undergone independent parallel development.

More revealing is the presence in two or more related dialects of a set of

shared phonetic innovations. The probability that such sets of features can be regarded as diagnostic isoglosses increases to the extent that the phonetic or phonological phenomena are not conditioned by one another. A sizable complex of common features is required to establish dialect-geographical relatedness of two living dialects.

But when ancient dialect groupings are reconstructed and dialect interrelations within the protolanguage are established, usually only a few shared phonetic features are observed, which makes it difficult to decide whether these features represent shared isoglosses or independent development. A decision to regard them as isoglosses and hence to regard the dialects as having had a period of common development may therefore not reflect actual history.

For this reason phonological phenomena which are candidates for classification as isoglosses must necessarily be coupled with phenomena of higher levels — morphological (grammatical) and lexical — which involve the two planes of content and expression. A group of innovations in different dialects which coincide in both form and content is the most reliable criterion for establishing common development for some period of time within some geographical area. Even a small set of such innovations may be sufficient for regarding them as isoglosses uniting certain dialects and distinguishing them from others.

Formal-functional innovations observed in particular groups of Indo-European dialects make it possible to distinguish dialect areas within Proto-Indo-European — proto-dialects, as it were, whose breakup brought about the formation of the historical Indo-European languages. Thus we can establish an intermediate stage between the common protolanguage and the separate historical dialects that have their origin in areal dialects of the protolanguage.

Morphological innovations yield especially significant isoglosses, since they are generally not borrowed but develop in a common direction from source structures and can therefore testify to the joint development of dialects during some time period.

Lexical innovations show a somewhat different picture. A lexical isogloss may be a whole lexeme found in one dialect group and absent from all the other dialects, in which case it is probably derived from some source in precisely this dialect group; or it may be a lexeme which is etymologically shared with other dialect groups but has distinctive semantic or derivational properties (and possibly even individual phonetic properties) found only in the dialect group in question.

When some word is found only in one dialect group and is completely absent from another, this can indicate that the word arose only in the first dialect group, in turn showing that the dialects of such a group underwent common development or were in close contact for some time period. On the other hand, it may be that the word was simply lost in the second set of dialects, which in turn would show that these dialects constitute a group opposed to the first group

which preserved the archaic word inherited from the protolanguage. This question is decided individually for each particular case, with phonetic, morphological, and semantic factors taken into account.

Morphological and lexical isoglosses established between dialects are the more convincing when they coincide with established phonetic sharings. Congruence of isoglosses from different levels of grammar is sufficient grounds for establishing common development within the protolanguage and joint development for some time after breakup.

The significance of phonological, morphological (grammatical), and lexical criteria for establishing whether sharings represent isoglosses will determine the order in which isoglosses linking the ancient Indo-European dialects are surveyed below. Morphological, phonological, and lexical phenomena will be surveyed in that order; they can be regarded as intersecting isoglosses representing different levels of grammar, and on the basis of those isoglosses we can group together and classify individual dialect groups within Indo-European and during their separate development up to the historically attested period.

7.2. Grammatical isoglosses as a means of grouping Indo-European dialects

7.2.1. *The nominative singular and the three-gender system in the Indo-European dialects*

In the nominative case, the opposition of feminine to masculine genders was formally expressed, in the feminine, by use of old collectives in **-ā*, **-ī*, **-ū* from original active-class words, plus the suffix **-s*, i.e. **-aH-s*, **-iH-s*, **-uH-s*. Regular phonetic development into **-ā*, **-ī*, **-ū* first yielded collective forms such as Dor. Gk. *phrātrā* (Ion. *phrétrē*) 'clan, phratry', as opposed to Gk. *phrātēr* 'brother'; *phūlē* 'tribe, phylum' as opposed to *phūlon* 'clan'; etc. Subsequently the collectives in **-ā*, **-ī*, **-ū* became associated with the meaning of feminine gender, and accordingly they became markers of the nominative singular feminine, opposed to markers of the nominative singular masculine.

This distinction and its endings were extended to the class of adjectives as well, due to the principle of formal agreement between adjective and noun, which is responsible for the formation of the system of nominal oppositions for masculine, feminine, and neuter genders:¹

**-ā*: Skt. *ásvā* 'mare', Lith. *ašvā*, Lat. *equa* 'mare' (cf. Skt. *ásvaḥ* 'stallion', Lat. *equus* 'stallion', beside archaic Gk. *híppos* 'stallion; mare').

**-ī*: Skt. *pātnī* 'lady, wife', Gk. *pótnia* 'lady' (Myc. *po-ti-ni-ja*), Avest. *-paθnī*

1. A formal gender opposition in the nominative naturally implies the same opposition in the other cases, in particular the genitive.

(*ha-paθnī* ‘concubine’, *damṇānō.paθnī* ‘lady of the household’), OLith. *viešpatni* ‘lady’; an *-ī*-stem (cf. the masculine *-ī*-stem: Skt. *pátih* ‘lord, master’, Avest. *paiti* ‘master, head of household’, Gk. *pósis* ‘husband’, Lith. *patis* ‘husband’; see Szemerényi 1964:337ff.).

*-*ū*: Skt. *śvaśrūh* ‘husband’s mother’, OCS *svekry*, Lat. *socrus*, OHG *swigur*, PIE **swek̑hruH-* (cf. *śvāsuraḥ* ‘husband’s father’, apparently a later shift from original **śvaśru-* to thematic *śvāsura-*; Hom. Gk. (*w*)*ekurós*, Lith. *šėšuras*; for **swek̑hru-s* as a masculine see Kurylowicz 1956:129, but cf. Trubačev 1959:121, Szemerényi 1964:292ff., 336).

The feminine markers *-*ā*, *-*ī*, *-*ū* that arose in this fashion from masculines in *-*ō*, *-*ī*, *-*ū* were reinterpreted in the various languages and became markers of the feminine gender independent of a masculine source form.

In turn, the thematic type in *-*o* spread among the masculines to displace earlier formations in *-*u* and *-*i* (cf. **swek̑huro-* > Skt. *śvāsura-ḥ* ‘husband’s father’, replacing **swek̑hru-*). Meanwhile *-*ī*, originally associated only with feminines from *-*i*-stems, became the typical marker of feminines corresponding to thematic masculines. This underscored the formal contrast between masculines and feminines: cf. Skt. masc. *deváh* ‘god’, fem. *devī* ‘goddess’; masc. *vṛkah* ‘wolf’, fem. *vṛkī-* ‘she-wolf’, in place of the expected *vṛkah* : **vṛkā* (cf. Lat. masc. *lupus* ‘wolf’, fem. *lupa* ‘she-wolf’) and *deváh* : **devā*, an opposition type preserved as a relic in forms like masc. *ásvaḥ* ‘horse’, fem. *ásvā* ‘mare’ and in a good many adjectives (an archaism in Sanskrit).

The fact that *-*ī* and *-*ā* were synonymous markers of different stems while they were still collectives and not yet feminines made it possible for them to combine into a compound suffix *-*iyā* (< **ī* + **ā*), cf. Gk. *phrātría*, OCS *bratrīja* ‘phratry’. In historical Greek this type was especially productive in athematic forms such as Gk. *phérousa* ‘carrying, one who carries’ (fem.) < **pherontyā-*, cf. analogous Sanskrit forms such as *bharant-yā-* ‘carrying’ (fem.) (OCS *berq̑šta* < **berqt-ja* ‘carrying’ (fem.)) beside Goth. *frijōnd-i* ‘friend’ (fem.).

This development of nominative masculine and feminine forms is especially typical of Sanskrit.

The diversity of nominative singular forms in the historical Indo-European dialects contrasts with a lack of formal diversity in Hittite and the other Anatolian languages. This situation reflects the complexity of gender classification in the first group of languages, which keep masculine, feminine, and neuter genders separate with distinct formal devices. The Hittite classification of nouns into common and neuter gender still shows a formal and semantic connection to the Proto-Indo-European classification of nouns into active and inactive. The general Indo-European tendency to contrast masculine, feminine, and neuter genders opposes the first group of languages to Anatolian; and in this respect Anatolian, in particular Hittite, can be regarded as conservative in contrast to

the other languages, which show a common innovation — the formation of a three-gender system.

However, this shared innovation is manifested in different formal categories, which makes it possible to distinguish morphological isoglosses and group particular sets of Indo-European dialects together.

7.2.2. The genitive singular

Morphological innovations making it possible to distinguish isoglosses uniting dialect groups appeared in genitive nominals when the formal opposition of masculine and feminine genders took shape. The masculine thematic type (with **-o-s* in the nominative) took a different genitive form than the corresponding feminine type. The archaic genitive ending **(o)s* is preserved in the feminine (Skt. gen. sg. *devyāḥ*, nom. sg. *devī* 'goddess'; Gk. gen. *theās*, nom. *theá* 'goddess'; OLat. gen. *familiās* in *pater familiās* 'father as head of household', nom. *familia* 'family'; Lith. gen. *žiemōs*, nom. *žiemà* 'winter'; Goth. gen. *gibōs*, nom. *giba* 'gift'); it is also preserved in athematic masculines (cf. Skt. gen. sg. *pad-āḥ*, nom. *pātī* 'foot', Gk. gen. *pod-ós*, nom. *poús*, Dor. *pōs* 'foot', Lat. gen. *ped-is*, nom. *pēs* 'foot').

In the feminine *ā* paradigm and in athematic stems, a formal distinction of nominative and genitive had been inherited from Proto-Indo-European, while in the thematic masculine type a phonetic modification of the genitive ending **-os* was required to formally differentiate it from the nominative **-os* and avoid grammatical homonymy as in Hittite nom. = gen. *antuhšaš* 'person'.²

There are three basic isoglosses in regard to the formation of thematic genitives:

Nominative		Genitive
<i>*-os</i>	~	<i>*-(o)s-yo</i>
<i>*-os</i>	~	<i>*-ī</i>
<i>*-os</i>	~	<i>*-ō</i>

Based on these isoglosses, the Indo-European dialects can be divided into three basic groups:

2. This may be connected to the Luwian replacement of the Proto-Anatolian thematic genitive in *-aš* by a special adjectival formation in *-ašši-*: Luw. *tiyammašši-* 'pertaining to earth' (= 'of earth'), *malhaššašši-* 'pertaining to ritual' (= 'of ritual'); it is semantically equivalent to the Hittite genitive: Luw. *tiyammaššiš* DUTU-za 'earthly sun' = Hitt. *taknaš ištanuš* 'Estan (sun god) of the earth'.

- (1) Indo-Iranian-Greek-Armenian
- (2) Tocharian-Italic-Celtic(-Venetic-Messapic)
- (3) Balto-Slavic(-Germanic)

In group (1) the thematic genitive is formed with the compound ending *-(o)s + yo, which goes back to the original genitive ending plus the syntactic linking element *-yo (see I.5.1.1 above): Skt. gen. *devā-sya*, nom. *devāḥ* 'lord'; Avest. gen. *ahurahyā*, nom. *ahura-* 'god, master'; OPers. gen. *kāra-hyā* 'army'; Hom. Gk. gen. *hípποιο*, nom. *hípπος* 'horse', gen. *theoío*, nom. *theós* 'god'; OArm. gen. *gorcoy*, nom. *gorc* 'deed' (cf. Gk. *wérɡon*), gen. *orboy*, nom. *orb* 'orphan' (cf. Gk. *orphanós*), gen. *mardoy*, nom. *mard* 'person'.

The fact that Sanskrit has the old thematic type in *-(o)syo is clear evidence that prehistoric Armenian had a masculine/feminine gender opposition; the gender opposition is the reason for the presence of a distinctive genitive form in the Indo-European dialects.

In dialect group (2) the thematic genitive has the ending *-ī, which suggests an etymological connection with the adjectival ending *-ī (as in Skt. *rath-ī* 'pertaining to chariot', see I.5.2.2 above). The original genitive ending *-os, preserved in athematic formations and the archaic feminine, was evidently replaced by a special marker *-ī in thematic genitives, which produced a formal opposition of masculine to feminine in the genitive:³

Latin	gen. <i>lup-ī</i>	nom. <i>lupus</i>	'wolf'
	<i>Volcānī</i>	<i>Volcānus</i>	'Vulcan'
	<i>dominī</i>	<i>dominus</i>	'lord'
	<i>equī</i>	<i>equus</i>	'horse'
Venetic	gen. <i>re.i.tii</i>		(pers. name; but see Polomé 1966:75)
Gaulish	gen. <i>Equi</i>		(name of month: Thurneysen 1946:181)
	<i>Segomari</i>		(pers. name)
Old Irish	gen. <i>maqi</i>		'son' (in Ogham inscriptions)

The Messapic forms in -i are less clear (Polomé 1966:75).

Cf. Tocharian A genitives in -i from athematic stems, e.g. gen. *pācri* 'father', *ñi* 'my, of me'; also *lāñci* 'royal, king's' from *lānt-* 'king', etc.

In dialect group (3) the thematic genitive has the ending *-ō, which goes back to an old ablative ending: *-ot' > *-ōd, cf. OLat. *lupōd*, Skt. *vṛkāt* 'from wolf'

3. Sometimes included with these forms are Faliscan forms derived from proper names: *eko Kaisiosio* (in vase inscription), *Evotosio* (Schwyzer 1939:I.555, Tronskij 1960:146, Watkins 1966:38); but the interpretation of these forms remains unclear (Thumb and Hauschild 1959:II.33, note 30).

(Stang 1966:44, 181). The fact that Hittite has an instrumental in *-et/-it* (Hitt. *kiššarit* 'with hand', *iššit* 'with mouth', *kardit* 'with heart', etc., with certain exceptions due to the nature of the syllabic cuneiform writing) cognate to the Indo-European ablative in **-ōd* (cf. OHitt. *šakuwat* 'from the eyes') shows that this case is particularly ancient in Indo-European declension.

Lith. gen.	<i>diēvo</i>	nom.	<i>diēvas</i>	'god'
Latv.	<i>dieva</i>		<i>dievs</i>	'god'
OCS	<i>boga</i>		<i>bogŭ</i>	'god'

The Germanic languages have a distinct innovation in the thematic masculine genitive ending. The genitive ending takes the form **-o-so*, **-e-so*:

Gothic gen.	<i>wulfis</i>	nom.	<i>wulfs</i>	'wolf'
Oicel.	<i>ulfs</i>		<i>ulfr</i>	'wolf'
OE	<i>dæges</i>		<i>dæg</i>	'day'

Old Icelandic *-s* is from older *-as* < **-oso*, cf. Runic gen. sg. *godagas*, personal name (Makaev 1965:125).

This Germanic ending can be compared to an Old Prussian ending of thematic nouns and pronouns: OPruss. gen. *deiwas*,⁴ nom. *deiws* 'god'. The Old Prussian pronominals with this ending in the non-feminine gender show similarity to the corresponding Germanic and Slavic pronominal forms:

OPruss. gen.	<i>stesse</i>	nom.	<i>stas</i>	'this'
Gothic	<i>þis</i>		<i>sa</i>	'this'
OCS	<i>česo</i>		<i>čito</i>	'what'

Since the ending **-eso/*-oso* in pronominals is found in a wider dialect circle which includes Balto-Slavic as well as German, it can be regarded as an isogloss distinguishing an areal group of Indo-European dialects and partly parallel to the nominal ending of masculine genitives.

Genitive pronominal forms in various Indo-European dialect groups merit separate discussion. First of all we have the Latin pronominal genitives *ēius* from nom. *is* 'this, that', *cūius* 'whose' (regarded as a genitive from *quis* 'who'). Sometimes these pronouns are compared to forms with suffixed **-syo*, apparently on the evidence of Indic and Greek cognates: Skt. gen. *tásya* from *sá(h)* 'that', Hom. Gk. gen. *toîo* from *ho* 'this, that, he' (see Tronskij 1960:122, 146,

4. The preservation of **-a-* in the genitive indicates a final vowel, which was later reduced (Stang 1966:10): *-as* < **.asa* < **.oso*. In contrast, the nominative, where there was no final vowel, regularly deletes its vowel before *s*: *-s* < *-as*.

191).⁵ But positing **-syo* in Latin raises both phonetic⁶ and morphological difficulties.

If Indo-European had had a distinct genitive case in **(o)syo* for masculines, the appearance of a second distinct form in several dialects (Italic, Balto-Slavic, Germanic) to displace the pre-existent form would be incomprehensible. Italic *ēius* and *cūius* could be explained as accretion of the particle **-yo-* to pronominal stems to yield **ei-yo-*, **kwi-yo-*, analogous to Slavic pronominal forms with the particle *-go*: OCS gen. *ko-go* 'of whom', *če-go* 'of what', *to-go* 'of that'.

Thus we can formally distinguish four isoglosses based on the morphological feature of a separate genitive in the masculine gender. The separate form was a natural consequence of the rise of the grammatical gender opposition in the Indo-European dialects. The isoglosses classify the dialects into four groups:

<i>*-(o)syo</i>	Indo-Iranian-Greek-Armenian
<i>*-ō</i>	Balto-Slavic
<i>*-e/oso</i>	Germanic(-Slavic)-Prussian
<i>*-ī</i>	Tocharian-Italic(-Venetic-Messapic)-Celtic

The isoglosses intersect only in the Balto-Slavic-Germanic group; the isoglosses of this group do not intersect with, and are mutually complementary to, the Indo-Iranian-Greek-Armenian group. The intersecting isoglosses of Germanic-Balto-Slavic point to particular closeness of these dialects in regard to this feature, and distinguish them from the **-(o)syo* dialects.

7.2.3. *Instrumental singular and plural forms. Cases with *-bh- and *-m-markers*

The use of the old ablative-instrumental ending **-ot'* in Balto-Slavic to mark a separate genitive case in masculine nominals is connected with the appearance of new instrumental formatives in these languages. In the new instrumental forms of Slavic, a formal opposition of masculine to feminine gender forms can again be observed. Gender-based classification was evidently becoming one of the basic driving factors in the reformation of the nominal paradigm, as is clearly reflected in the functions of the new nominative and accusative cases as shown above.

5. Watkins 1966:38, following Pokorny, proposes a similar explanation for OIr. *a* 'his' (with lenition), cf. MWelsh *eiddaw* (for the same view see Lewis and Pedersen 1937 [1954:267]); but for arguments against this explanation see Thurneysen 1946:285.

6. Other examples of **-syo* > *-iyo* are lacking in Latin. The development is proposed *ad hoc* on the basis of only these two forms.

The parallelism in the development of the instrumental and nominative (as well as genitive) cases, whereby their forms depended on grammatical gender, becomes understandable when their functional and semantic identity as markers of the semantic agent is considered: the agent is marked by the nominative case in an active construction, but by the instrumental when the active construction is passivized. Analogously, the genitive marks the agent when a verbal construction is nominalized.

In Slavic, *-mĭ* < **-mi* is the marker of the instrumental in masculine nominals: OCS masc. instr. *vlĭko-mĭ*, nom. *vlĭkŭ* 'wolf'; instr. *synŭmĭ*, nom. *synŭ* 'son'; instr. *gostĭmĭ*, nom. *gostĭ* 'guest'; cf. also fem. instr. *rŭqkŭ*, nom. *rŭka* 'hand, arm'; *nošĭjŭ*, nom. *nošĭl* 'night'.

This isogloss unites the Slavic languages with Baltic; there are a few discrepancies in the details of thematic and athematic masculine and feminine forms (see Mažiulis 1970).

Masculine thematic type: Lith. instr. *vėju*, nom. *vėjas* 'wind'; instr. *tėvu*, nom. *tėvas* 'father'; instr. *vilkŭ*, nom. *vilkas* 'wolf'. The *-u* ending can be compared to Skt. *-ā* in Ved. *vṛkā* '(with, by) wolf', Avest. *vahrka*, OHG dat.-instr. *wolfu* (PIE **-ō*, instrumental ending).

Feminines in *-ā*: Lith. instr. *rankà*, nom. *rankà* 'hand, arm'; instr. *galva*, nom. *galvà* 'head'. The instrumental ending **-a* goes back to **-ān*, cf. Slav. *-q*.

Athematic type (masculine and feminine): Lith. instr. *vagi-mì*, nom. *vagis* 'thief'; instr. *sūnu-mì*, nom. *sūnùs* 'son'.

Another dialect group based on an instrumental-singular isogloss consists of Greek and Armenian. The isogloss is formed by the marker **-bhi*, which already appears in Mycenaean as an adverbial particle and has the function of a syntactic instrumental case: Myc. Gk. *-pi*, Hom. *-phi*. Examples: Myc. *e-ru-ta-ra-pi* '(with, by) red' (= Gk. *eruthrā-phi*; see Morpurgo 1963:100-101); *qe-to-ro-po-pi* '(with) four-legged (beings)' (= Gk. *tetrópopphi*; Lejeune 1958:159-84). Examples of the Old Armenian instrumental in *-b/-w*: instr. *dustr-b*, nom. *dustr* 'daughter'; instr. *baniw*, nom. *ban* 'word'; instr. *gineaw*, nom. *gini* 'wine'.

The ending *-phi* as an instrumental in Greek does not distinguish number: it can be joined to singular, dual, and plural forms (and is thereby typologically comparable to the Hittite instrumental in *-it*, which expresses both singular and plural number). In contrast, in Indo-Iranian the etymologically related ending **-bhi* appears in the form *-bhis* in the instrumental plural:⁷

Skt. instr. pl. *nau-bhíh*, nom. sg. *náuh* 'ship' beside Hom. Gk. instr. pl. *naū-phi(n)*, nom. sg. *naūs* 'vessel; fleet', Avest. instr. *gaēθābiš* from *gaēθā* 'essence, being'; instr. *padābiš* from *pad-* 'foot'.

7. The instrumental plural in *-w-k'*, *-b-k'* of Old Armenian can be compared to Sanskrit *-bhih*; the only difference is that in Indo-Iranian the ending **-bhi-* (extended by the plural marker **-s*) appears only on plurals.

The same **-bhi* underlies the dative-ablative plural ending in Indo-Iranian:

Skt. dat-abl. pl. *devébhyaḥ*, nom. *devāḥ* 'god'; Avest. dat-abl. *urvarābyas(-ča)* '(and) to plants' from *urvarā-* 'plant'.

Thus (as with the **(o)syo* isogloss) an Indo-Iranian-Greek-Armenian dialect group can be singled out based on the innovation of **-bhi* as a marker of instrumental singular and plural.

The Indo-Iranian dative-ablative ending **-bhyas* < **-bhyos* can be compared to the ending **-bhos* reflected in the dative and ablative plural in Italic:

OLat. dat., abl. pl. *trebibus*, nom. sg. *tribus* 'tribe'

Latin dat., abl. pl. *rēgibus*, nom. *rēx* 'king'

dat., abl. pl. *hostibus*, nom. *hostis* 'enemy'

Venet. dat., abl. pl. *oposo-phos* 'deeds' ('*operibus*'), Messap. *-bas*
(see Polomé 1966:74).

The same ending can be found in the Celtic dative plural:

Gaul. dat. *matrebo* 'mothers' (= Lat. *matribus*)

OIr. dat. *fer(a)ib* 'men', nom. sg. *fer*.

Although the initial consonant element of this ending is the same in the Indo-Iranian-Greek-Armenian and Italic-Celtic groups, nonetheless they cannot be formally reduced to the same form and must be regarded as endings of different origins. We can then consider Italic-Celtic **-bhos* a distinct morphological innovation, separate from Indo-Iranian **-bhyos*, and set up a separate isogloss uniting Italic-Venetic-Messapic-Celtic in one Indo-European dialect group (as with the genitive singular **-ī* isogloss).

Another Indo-European dialect group showing shared dative and instrumental plural markers is Balto-Slavic-Germanic. The isogloss is instr. pl. **-mīs*, dat. pl. **-mus/*-mos* (which links these languages as do the genitive **-ō* and **-eso* isoglosses):

Lith. instr. pl. *sūnumīs*, nom. *sūnūs* 'son'; instr. pl. *avimīs*, nom. *avis* 'sheep'

OCS instr. pl. *gostīmi*, nom. *gostī* 'guest'; instr. pl. *kamenīmi*, nom. *kamy* 'stone'

Lith. dat. pl. *sūnūms* 'son', *avīms* 'sheep'

OCS dat. pl. *gostīmŭ* 'guest', dat. pl. *kamenīmŭ* 'stone'

Gmc. **-mz*: Goth. *prim*, OIcel. *primr* 'three'.

Thus the isogloss of the dative and instrumental plural endings distinguishes the same dialect groups as the genitive endings in masculine **-o-* nominals. In this sense the two isoglosses coincide.

An isogloss taking in a wider dialect area is the instrumental plural marker **-ōis* of masculine thematic stems. This morphological innovation affected all Indo-European dialect groups except Anatolian and has to do with the differen-

tiation of noun stems based on gender, a tendency that did not affect Hittite.

- Skt. instr. pl. *deváih* from *deváh* 'god'
 Avest. instr. pl. *mašyaiš* from *maša-* 'person'
 Lith. instr. pl. *vilkaĩs*, nom. sg. *vilkas* 'wolf'
 Lat. dat. pl. *lupĩs*, nom. sg. *lupus* 'wolf'
 Osc. dat. pl. *nesimois* 'neighbor'.

7.2.4. The locative plural

The next isogloss groups dialects together based on the form of their locative plural:

Skt.	loc. pl. <i>devéṣu</i>	nom. sg. <i>deváh</i>	'god'
OCS	<i>raběxŭ</i>	<i>rabŭ</i>	'slave'
Skt.	<i>sénāsu</i>	<i>sénā</i>	'army'
OCS	<i>rŏkaxŭ</i>	<i>rŏka</i>	'hand, arm'
Lith.	<i>rañkosu</i>	<i>rankà</i>	'hand, arm'
Gk.	<i>phíloisi</i>	<i>phílos</i>	'friend'
Gk.	<i>Athénēsi</i>		'in Athens'

This isogloss unites Indo-Iranian and Balto-Slavic, and (in its structural shape but not in its phonetics) Greek. The specifically locative marker is the final **-u*; it follows the plural marker **-s*, which in turn follows the general marker of locativity, **-i* (**-oi* in thematic stems, cf. Skt. loc. sg. *devé*, Gk. *oíkoi*, Lat. *domī*). The agglutinative structure of the locative may be regarded as a relatively late dialectal phenomenon (Hittite completely lacks a locative plural; it has a general case ending *-i* contrasting with a directive in *-a* in Old Hittite) uniting several dialects. (For the Old Hittite *-a* directive see also Shields 1982.) The similarly agglutinative structure of the locative plural in Greek, which has a final element *-i* rather than *-u*, can be considered a dialect feature uniting Greek with Indo-Iranian-Balto-Slavic.

The agglutinative locative plural of these dialects can be considered to reflect a tendency to distinguish the locative proper from the instrumental plural which ultimately goes back to an old locative plural. The Latin case forms are significant in this regard; the locative and instrumental plural reflect an original dialectal form which did not formally distinguish the two cases: cf. Lat. instr. pl. *equĩs*, locative and instrumental plural from *equus* 'horse'.

The development of the locative plural in Indo-Iranian-Balto-Slavic-Greek is of some interest to diachronic typology as an example where an old ending (the locative marker **-i*) was reanalyzed and an additional marker appeared (*-u* in Indo-Iranian and Balto-Slavic, *-i* in Ancient Greek) to signal the grammeme lost by the old ending.

7.2.5. *Dual forms. The first-person singular pronoun paradigm*

The same dialects — Indo-Iranian and Slavic — also share certain relatively late dual forms, e.g. the genitive-locative dual in **-os*: Skt. *agnyóḥ* from *agní-* ‘fire’, OCS *pqŕtju* from *pqŕtī* ‘path’.

Part of the same pattern are shared Indo-Iranian-Slavic traits such as the identical formation of certain personal pronouns, for example the first-person singular nominative: Skt. *ahám*, Avest. *azəm*, OPers. *adam*, OCS *azŭ*, contrasting with the archaic form lacking the particle **-em* and reflected in Hitt. *uk*, obl. *ammuk*, Lat. *egō*, Gk. *egō*, Goth. *ik*, etc.

The genitive forms of this pronoun coincide in the same dialects: Avest. *mana* ‘of me’, OPers. *manā*, OCS *mene* (Bonfante 1931:83, Porzig 1964:243), as do the accusative forms (an isogloss shared by Albanian): Skt. *mām*, OPers. *mām*, OPruss. *mien*, OCS *mę*, Alb. *mua*, *mue* < **mēm* (Bonfante 1931:83, Porzig 1964:267).

7.2.6. *The forms of deictic pronominals. Enclitic pronouns in Anatolian as an archaic correspondent to the deixis of other Indo-European dialects*

A separate problem is presented by the relations among the deictic pronominal forms, which were later reinterpreted as third-person personal pronouns in the Indo-European dialects. Based on the Indo-Iranian, Greek, Gothic, and Tocharian forms we can reconstruct masculine- and feminine-singular paradigms with opposed nominative and oblique forms, contrasting to a single stem form in the neuter paradigm:

	Singular		
	masculine	feminine	neuter
Nominative	<i>*so</i>	<i>*sā</i>	<i>*tho</i>
Accusative	<i>*thom</i>	<i>*thām</i>	<i>*tho</i>
Sanskrit	<i>sá(h)</i>	<i>sā́</i>	<i>tāt</i>
	<i>tām</i>	<i>tām</i>	<i>tāt</i>
Tocharian A	<i>sām</i>	<i>sām</i>	<i>tām</i>
	<i>cam</i>	<i>tām</i>	<i>tām</i>
Tocharian B	<i>se</i>	<i>sā</i>	<i>te</i>
	<i>ce</i>	<i>tā(k)</i>	<i>te</i>
Greek	<i>ho</i>	<i>hē</i>	<i>tó</i>
	<i>tón</i>	<i>tān</i>	<i>tó</i>
Gothic	<i>sa</i>	<i>sō</i>	<i>þata</i>
	<i>þana</i>	<i>þō</i>	<i>þata</i>

With this paradigm, assuming generalization of one of the two stem forms to the entire paradigm, we can explain the Balto-Slavic and Celtic-Italic forms, which are motivated by subsequent restructuring of the gender system in these dialects.

Dialects generalizing the oblique stem form in **-th-*:

Lithuanian	masculine	feminine	
nom. sg.	<i>tàs</i>	<i>tà</i>	
acc. sg.	<i>tĩ</i>	<i>tĩ</i>	
Old Church Slavic	masculine	feminine	neuter
nom. sg.	<i>tŭ</i>	<i>ta</i>	<i>to</i>
acc. sg.	<i>tŭ</i>	<i>tŏ</i>	<i>to</i>

Dialects generalizing the nominative stem form in **s-*:

Old Latin	masculine	feminine
nom. sg.		<i>sa-psa</i>
acc. sg.	<i>sum</i>	<i>sam</i>
Gaulish	neuter	
acc. sg.	<i>so-sin, so-sio</i>	

This system of third-person demonstrative pronouns is obviously connected with the Hittite enclitic pronouns:

common gender	nom. sg.	<i>-aš</i>
	acc. sg.	<i>-an</i>
neuter gender	nom.-acc. sg.	<i>-at</i>

Cf. OHitt. *na-aš a-ku* 'and let him die' (Hittite Laws); *ta-aš a-ri* 'and he comes' (KBo XVII 9 I 16'); *ša-aš* BA.UG₆ 'and he died' (BoTU 12 A I 40); *ša-an iš-pa-an-di na-ak-ki-it da-a-aḫ-ḫu-un* 'and him I took at night by assault' (Anittas, KBo III 22 47-48); *ta-at e-ku-ut-ta* 'and he drank it' (KBo XII 3 III 16'); *na-at-kán ša-an-ḫa-[an] e-eš-du* 'and may it be removed' (BoTU 9).

The Old Hittite plural forms of the common gender are marked by *-t*, which coincides with the plural forms in the dialects surveyed above: Hitt. *-at* 'they',⁸ Luw. *-atta* 'they' beside Skt. masc. pl. *té*, fem. *tāḥ*; Gk. masc. pl. *toí*, fem. *taí*;

8. E.g. *ta-at ... ḫa-aš-ši-i ... ti-ya-an-zi* 'and they come up to the hearth' (KUB II 5 V 8).

Goth. masc. pl. *pai*, fem. *þōs*; Toch. A masc. pl. *cai*, B *cem*, fem. *tom*. As a common protoform for these dialects we can posit masc. pl. **thoi* with a stem in **th-*.

The distribution of stems in the pronominal paradigms given above and in the Hittite enclitic paradigm makes it possible to regard the Hittite enclitics *-aš*, *-at* as etymologically related to the **-s-* and **-th-* stems reflected in the other dialects. Then we can reconstruct a Proto-Indo-European pronominal paradigm of the form **oso*, **otho*, with reduction of one or the other vowel in the individual dialects: in Hittite the final vowel is lost, while initial **o-* is lost in the other dialects.⁹

The semantics of the enclitic pronouns reflects the earlier Indo-European situation with its traces of the older active/inactive opposition; in Hittite the opposition was reinterpreted as one of common gender (with ending *-aš*) to neuter gender (*-at*). The stem in *-t* also appears in the plural forms. Thus Hittite, and the Anatolian group as a whole, are opposed to all the remaining Indo-European dialects, in which a binary pronominal system was reshaped into a ternary system opposing masculine, feminine, and neuter genders. However, the ternary system carries traces of the older binary opposition preserved in altered form in Hittite. The active-class stem **oso* is used for nominative pronominals, and the inactive **otho* is used for the oblique cases, primarily the accusative, which semantically goes back to the syntactic inactive (see I.5.1.4 above). The plural paradigm continues the same stem, which must have characterized the earliest inactive.¹⁰

In this respect the Indo-European dialects other than Hittite show a common innovation allowing them to be placed together in the earliest dialect group, opposed to Anatolian. This isogloss in essence coincides with the isoglosses for ternary grammatical gender (masculine, feminine, neuter) displayed in nominal and adjectival constructions.

The pronominal forms **oso*, **otho* which can thus be reconstructed as active and inactive-class pronominals are obviously connected to the class markers — active **-s*, inactive **-th* — posited for earliest Indo-European in pronominals such as **khoi-s*, **khoi-th*, **yo-s*, **yo-th*. These forms are reflected in all the

9. A VCV structure, with later loss of one of the vowels, is an extremely common pronominal stem shape in the Indo-European dialects: Gk. *emé*, *emós*, Hom. *emeío*, Arm. *im* beside Skt., Avest. *mā*, Lat. *mē*, Gk. *me*, OIr. *mé* ('I'); Skt. *ana-* 'this', Avest. *ana-*, Gk. *énē*, Lat. *enim*, Umbr. *ene*, Osc. *inīm*, OCS *ono*, Hitt. *anniš*, abl. *annaz* beside Skt. *ná* 'how', Lith. *ne*, OCS *ne-že*, etc.

10. This etymology for the dialect pronoun **so*, **sā*, **tho* rules out the possibility, suggested by Sturtevant, of relating it directly to the syntactic linking particles attested in Hittite as *ša-*, *ta-*. The syntactic properties of *ša-* and *ta-* in Hittite do not confirm the functional characteristics proposed by Sturtevant, properties he connected to the alternating stem forms of the Indo-European pronominal system (Gamkrelidze 1957). On the other hand, relating these forms to the Hittite enclitic pronouns makes it possible to give a satisfactory formal and functional explanation for them.

Indo-European languages, including Anatolian, as pronouns of masculine-feminine (Anatolian common) and neuter gender, respectively.

On the other hand, in most Indo-European languages the pronouns **oso*, **otho* turned into deictic forms with the function of articles,¹¹ respectively masculine-feminine and neuter; but in Hittite (or Anatolian in general) they became enclitic pronouns (Hitt. *-aš*, *-at*), and new independent third-person pronouns involving the same markers were formed for the common and neuter genders (Hitt. *apaš*, *apat*). In this dialectal innovation, too, Hittite (or Anatolian) is opposed to all other Indo-European dialects.

7.2.7. Relative pronoun forms in the Indo-European dialects

Dialect groups can be distinguished among the Indo-European languages based on which of the relative pronoun forms, **khois*/**khoith* or **yos*/**yoth*, they preserve. Dialects which preserve **khois*/**khoith* in the function of relative pronoun include Italic, Hittite, and Tocharian (Lat. *quis*, *quid*, Osc. *pís*, OIr. *ci*-, Toch. A *kus*, B *kuse*). Those preserving **yos*/**yoth* in relative function include Indo-Iranian-Greek, Slavic, and Phrygian (Skt. *yá-h*, *yá*, *yá-d*, Avest. *ya-*, Gk. *hó-s*, *hē*, *ho*, Phryg. *ios*, OCS *i-že* (Porzig 1964:256, 282-83)).

It should be kept in mind that a dialect grouping based on a shared isogloss involving loss and reanalysis of structural elements does not necessarily imply joint development of the dialects. In some instances the isogloss may reflect independent separate development of structural tendencies already present in the protolanguage. Obviously such facts can be taken as a basis for dialect grouping only when more diagnostic isoglosses set off the same areal group. In this case, the loss of **khois* in relative function is likely to have been a shared innovation of Indo-Iranian-Greek, Phrygian, and Slavic,¹² since there are a number of other, more diagnostic isoglosses to justify positing historical areal unity for these dialects.

7.2.8. Degrees of comparison in adjectives

One of the main morphological isoglosses for Indo-European dialect groups is the morphological type of the comparative degree of the adjective. The Indo-Iranian-Greek group is set apart by a comparative in **-thero-* > Skt. *-tara-* (cf. *śuci-* 'clean', *śuci-tara-* 'cleaner'), Gk. *-tero-* (*pistó-tero-s* 'more correct',

11. Compare the article functions of **so*, **tho* in Greek, and also in Gothic and other Germanic languages.

12. In these dialects, **khois* is retained only in the function of interrogative pronoun, not relative pronoun: Avest. *čit*, Gk. *tis*. There is an analogous reflex in Celtic: OIr. *cid* 'who?'.

alēthēs-tero-s 'truer') and a superlative in **-is-tho-* (formed from **yos* plus **-tho*: Benveniste 1948, Kacnel'son 1949) which is also found in Germanic. Examples: Skt. *-iṣṭha-*, e.g. *svād-iṣṭha-* 'sweetest' from *svādú-* 'sweet'; Gk. *-is-to-*, cf. *héd-isto-s* 'sweetest, most pleasant', from *hédús*; Goth. *-ist-*, cf. *bat-ista* 'best'.

Another isogloss sets off the Celtic-Italic group, where the superlative degree is in **-s-(mo)-*: Lat. *maximus* 'biggest' (cf. *proximus* 'closest'), Osc. *nessimas* 'closest' (nom.pl.f.), OIr. *nessam*, Welsh *nessaf* 'closest' (see Watkins 1966:36-37).

7.2.9. The formation of the aorist and the reshaping of the Proto-Indo-European binary verb system

The verbal system also yields clear isoglosses for grouping the Indo-European dialects. The formation of an opposition of 'present', aorist, and imperfect to replace the older binary opposition of Proto-Indo-European is an isogloss uniting the Indo-Iranian-Greek-Armenian dialect group (see Birwé 1956, Pisani 1957a). The new systems of tense oppositions in this group are not only semantically isomorphic but also formally related in their segmental correspondences.

Especially conspicuous among the innovations uniting the verbal systems of these dialects are those that led to the rise of the aorist system. Forms with the augment (from the old syntactic linker **e-*, see I.6.6.1 above) were created in the Indo-Iranian-Greek group on the pattern of the aorist, as were personal endings of the **-m(i)* series, which were reanalyzed in these forms as tense-aspect markers contrasting to the **-Ha* series markers on the same verb stems:

Skt. 1sg. aor. *á-dā-m* 'I gave' (cf. Gk. 1pl. aor. *é-do-men*) beside Hitt. *dahḫi* 'I take', pret. *dahḫun*, Hier. Luw. *taha* 'I took'; Skt. *á-dhā-m*, Gk. *é-the-men* beside Hitt. *teḫḫi* 'I put', pret. *teḫḫun*; Skt. *á-bhūv-am* 'I became', Gk. *é-phū-n*; Skt. *á-gā-m* 'I went', Gk. *é-bē-n*, Phryg. *e-daes*.

Attested in the same area are dialect innovations involving reduplicated presents from these verb stems; in other dialect areas there is no reduplication in the present:

Skt. 1sg. pres. *dádā-mi* 'I give', Gk. *dídōmi*; Skt. *dádhā-mi* 'I put, stand', Gk. *títēmi*.

Related to this innovation in the root aorist is a thematic aorist form which evidently appeared in the same dialect area and yields regular reflexes in Indo-Iranian, Greek, and Armenian:

Skt. 3sg. aor. *á-vid-a-t* 'he found', Gk. *é-wid-e* 'he saw', OArm. *e-git* 'found' (see Watkins 1969: §43, 63-64; §83, 101; Szemerényi 1970:262); cf. also the reduplicated stems of Skt. 1sg. aor. *á-voc-a-m* < **a-va-uc-o-m* 'I said', Hom.

Gk. *é(w)eip-o-n* (Thumb and Hauschild 1959:II.302, §544).¹³

The formation of the aorist category in these dialects is connected with a complete restructuring of the entire inherited verb system. With the rise of the aorist, the old unaugmented forms of the **-mi* series with secondary endings began to be reanalyzed as imperfects, opposed in aspect to the aorist and to the inherited forms of the **-Ha* series, which began to be interpreted as perfects. These structural-semantic transformations in the individual Indo-European dialects led to the formation of the complex tense system found in such attested dialects as Indo-Iranian and Greek.

7.2.10. The two Indo-European middles in **(H)oi/*-moi* and **-r*. Dialect groupings based on middle types

One of the major innovations among the Indo-European dialects was the rise of middle forms with tense oppositions. The category of middle arose during the Proto-Indo-European stage after the whole system had been restructured from the active type to the accusative type that implies a semantic classification of verbs based on transitivity. The restructuring inevitably led to the formation of middle verbs which were opposed to active transitives. The interrelation of this category and tense varied among the dialects. There are two major dialect areas in Proto-Indo-European realizing different surface-structure possibilities for the combination of middle and tense.

In one of the areas the middle is marked by transformations in the personal endings of the **-mi* and **-Ha* series that were available in the morphological inventory inherited from the preceding period (for more on these forms see above):

13. Unlike the athematic and thematic aorist types surveyed above, the sigmatic aorist of Indo-Iranian-Greek-Slavic (Skt. 1sg. aor. *á-vāk-ṣ-am* 'I rode', OCS *vēs-ŭ* 'I drove, conveyed', Gk. *édeiksa* 'I showed') is an innovation that arose as a result of functional reanalysis of the *-s*-forms, originally of non-present meaning, that were found throughout the whole Indo-European area. The reanalysis yielded various modal and temporal (non-present) meanings in the various dialects. In addition to the aorist meaning in the dialect group just mentioned, *-s*-forms can carry the following meanings in individual historical dialects:

(a) Past tense: Hittite, Tocharian, Latin, Old Germanic: Hitt. 3sg. past *memišta* 'he said', Toch. B *takāsta* 'you were'; Lat. *dīxī* 'I said' (cf. the formally corresponding Gk. *édeiksa*, which has aorist meaning), Lat. *uēxī* 'I rode' (cf. the formally corresponding Skt. *ávākṣam* with aorist meaning); also Celtic (Watkins 1962:174ff.).

(b) Future tense: Osco-Umbrian, Old Irish, Greek, Sanskrit, Lithuanian: Osc. and Umbr. *just* 'he will be', OLat. *faxō* 'faciam', 'I will make' (Plautus, *Truc.* 643), OIr. *seiss* 'he will sit'. In several dialects, **-s*-forms with future meaning also take the **-yo-*formative: Gk. *deiksō* 'I will show' < **deik-syō* < **r'eikh-syō*, Skt. *deksyāmi* 'I will show', *dāśyāmi* 'I will give', Lith. *dúosiu* 'I will give', *pláuksiu* 'I will swim'.

(c) Non-indicative moods: subjunctive in Celtic: OIr. *fess-* 'lead', *sáss-* 'seek' (Watkins 1962:128-29); precativ in Sanskrit: Skt. *budhyāsam* 'may I wake up', etc.

1sg.	*-oi/*-ai, *-moi	
2sg.	*-soi	
3sg.	*-thoi	3pl. *-nthoi

In the other area it is marked by adding an element *-r* to the basic endings that had developed from the same two series of personal endings:

1sg.	*-Hor/*-mor	
2sg.	*-thHor	
3sg.	*-thor	3pl. *-nthor

Historical dialects going back to the first area include Indo-Iranian, Greek, and apparently Balto-Slavic and Germanic:¹⁴

Skt. *bruv-é*, Avest. *mruy-ē* 'I speak'; Runic Norse *haite*, OIcel. *heite* 'I am called' (Birwé 1956:41-51); Skt. *bhára-se* 'you carry for yourself', Gk. *phére-ai* (*phérēi*) 'I carry for myself'; Skt. *śéte* 'he lies', Gk. *keítai* 'he lies'; Skt. *áste* 'he sits', Gk. *hês-tai*; Skt. *bhára-te* 'he carries for himself', Gk. *phére-tai* 'he carries for himself'.

Dialects going back to the second area include Hittite, Tocharian, Italic, Celtic, and Phrygian. For Hittite we can set up the following middle endings, which go back to the Indo-European endings posited above:

1sg.	-ḫaḫari	
2sg.	-tati, -tari	
3sg.	-tari/-ari	3pl. -antari

The final *-i* of these endings is a specifically Hittite innovation, absent in the closely related Anatolian languages (cf. the final *-i* marking personal endings of the present tense in the **-Ha* series forms of Hittite). In Palaic and Luwian the Hittite endings correspond to endings without *-i* in the same function: Hitt. *kittari* 'lies', Pal. *kittar*; cf. Luw. *dadduwar* 'put for yourself' (Laroche 1959a:89, Otten 1953a:47) beside Hitt. 2pl. middle *-dumari* (1pl. *-waštari*).

14. In Balto-Slavic we can find traces of endings which formally coincide with the middle endings proposed for this dialect group, although with a somewhat different function, probably due to a later tendency to lose this category in Balto-Slavic and Germanic. Slavic preserves only one form going back to the middle: OCS *vědě* 'I know'. The meaning 'know' is a natural development of the middle, since it expressed subject version. A typological analogy can be found in languages with morphologically expressed subject version, e.g. Georgian (*v-i-c-i* 'I know', with etymological subject version in *-i*); for Slavic see also Ivanov 1968. It is also significant that Old Lithuanian forms in **-mai* > **-mie* (cf. OPruss. 1sg. *-mai*, 2sg. *-ai* take a reflexive pronoun to express the same semantics as the mediopassive (Lith. *vel-mie-s* 'I want': Stang 1966:137-39, 315, 406, Watkins 1969:211). This is comparable to the Slavic and Germanic developments. For Old Germanic a reflex of old **-Hoi* forms is proposed: Runic Norse *haite*, OIcel. *heite* 'I am named, called'.

In Tocharian middle forms, the *-r* ending generalizes to the entire present-tense paradigm:

1sg.	Toch. A <i>-mār</i>	B <i>-mar</i>	pl. A <i>-mtār</i>	B <i>-mt(t)ār</i>
2sg.	<i>-tār</i>	<i>-tar</i>	<i>-cār</i>	<i>-tār</i>
3sg.	<i>-tār</i>	<i>-tār</i>	<i>-ntār</i>	<i>-ntār</i>

Corresponding endings can be distinguished for Italic and Celtic:

	Latin	Osc., Umbr.	Old Irish
1sg.	<i>-ōr</i>		<i>-ur</i>
2sg.	<i>-re, -ris</i>		<i>-ther > -ter</i>
3sg.	<i>-tur</i>	<i>-ter</i>	<i>-thar (-ar)</i>
3pl.	<i>-ntur</i>	<i>-nter</i>	<i>-tir</i>

The same type was apparently represented in Phrygian: cf. 3sg. *-tor*.

Based on these innovations of middles which originally characterized two large areas of Proto-Indo-European, we can propose an ancient dialect division into two dialect groupings which united the later Indo-Iranian-Greek and Balto-Slavic-Germanic groups on the one hand, and Hittite-Tocharian-Italic-Celtic on the other.

Analysis of the dialectally conditioned middle forms makes it clear that these forms do not reflect the emergence of a new category of middle in the Proto-Indo-European verbal system. The category must have arisen prior to this dialect division, when it was marked by formatives common to the entire area. This is shown by the fact that certain shared formatives can be found in the early historical dialects of both areas. We can see a Proto-Indo-European formative **-tho-*, with middle semantics and no tense differentiation, in such historical formations as Hittite 3sg. pres. *kitta* 'lies' (cf. later *kittari*), Hitt. *wešta* 'gets dressed', Ved. 3sg. imperf. *vāsta* 'got dressed', Hom. Gk. 3sg. pluperf. *héstō* (see Watkins 1969:131, §117). The fact that these forms differ in tense but are formally identical can be understood as reflecting an original middle meaning that was indeterminate as to tense. Tense differentiation must have taken place later, with the help of the dialectal **-i* and **-r* elements; it was this that led to the formation of the two dialect groupings.¹⁵

15. Somewhat later, combinations of middle and tense were expressed by various formatives in various dialects, as is reflected in the Tocharian middle paradigm: forms in *-r* are present middles, as in other dialects of this area, while endings in **-i* (1sg. Toch. B *-mai*, A *-e*, *-we*, 2sg. B *-tai*, A *-te*) mark the preterite middle — unlike the other dialects of this area, where *-i* carries present-tense meaning.

7.2.11. *The subjunctive in a long vowel*

In Tocharian and Italic-Celtic — a dialect group roughly coinciding with one of the two just discussed — we find a morphological isogloss involving the formation of subjunctive verb forms with a long vowel, *-ā- (*-ē-):

Toch. B 3sg. subjunctive *kārs-a-m* 'he will know' (-a- < *-ā-)

Toch. A 1sg. subjunctive *kalk-a-m* 'I will go'

1sg. Lat. *feram* OIr. *bera*

2sg. *ferās* *bere*

3sg. *ferat* *berid*¹⁶ (Lewis and Pedersen 1954:340)

7.2.12. *Modal formations in *-l-. Mediopassive participles in *-mo-*

Among the separate isoglosses of the early period are shared modal markers in Hittite, Tocharian, Armenian, and Slavic. Hittite forms such as *bar-ga-nu-la* '(those) which should be made high', *da-lu-uk-nu-la* '(those) which should be made long' (KUB XII 63 I 30-31; see Pedersen 1947:60-64) can be compared to Tocharian forms like *yokalle* 'what is to be drunk', *śwālle* 'what is to be eaten' and Armenian forms like *sireli* 'what is to be loved' (Benveniste 1959:97); cf. Slavic forms in *-lŭ* with modal meaning such as OCS *neslŭ* 'the one who could be carried' (participle from *nesti* 'carry'): Ivanov 1968, Solta 1970.

Another isogloss, similar in that it joins Anatolian with Baltic and Slavic, is the present mediopassive participle in **-mo-*: Luw. *keš-ama-* 'combable', Hier. Luw. *asimi-* 'lovable' (cf. Hitt. *lalukkima-* 'radiant'); cf. the type seen in Russ. *ljubimyj* 'favorite', *vidimyj* 'visible', Lith. *nešimas* 'being carried', etc. (Hamp 1973).

7.3. **The chronological sequence of dialect division in Indo-European**7.3.1. *The correlation of grammatical isoglosses with stages in the dialect division of Indo-European*

The morphological isoglosses surveyed above are listed in Table 1 in the order in which they were discussed.

16. The Balto-Slavic forms that coincide structurally with these and carry past-tense meaning may actually not belong to this isogloss but reflect a wider dialect area in which the past tense is marked by forms in long vowels (the Greek aorist in *-ē-* with secondary endings: see Watkins 1969:214, § 206, Toporov 1961, 1963).

Table 1
Morphological isoglosses in Indo-European

Isogloss	Dialect area
1. Feminines in <i>*-ā, *-ī, *-ū</i>	All except Anatolian
2. Genitive singular <i>*(o)syo</i>	Indo-Iranian, Greek, Armenian
2a. Genitive singular <i>*-ī</i>	Tocharian, Italic, Celtic, Venetic, Messapic
2b. Genitive singular <i>*-ō</i>	Baltic, Slavic
2c. Genitive singular <i>*-eso</i>	Germanic, Baltic
3. Instrumental singular masculine <i>*-ō</i>	Indo-Iranian, Germanic, Baltic
4. Oblique cases in <i>*-m-</i>	Baltic, Slavic, Germanic
4a. Oblique cases in <i>*-bhi-</i>	Indo-Iranian, Greek, Armenian
4b. Dative plural in <i>*-bhos</i>	Italic, Celtic, Venetic, Messapic
5. Instrumental plural masculine <i>*-ōis</i>	All except Anatolian
6. Locative <i>*-s-u/*-s-i</i>	Indo-Iranian, Baltic, Slavic, (Greek)
7. Genitive-locative dual <i>*-os</i>	Indo-Iranian, Slavic
8. 1sg. personal pronoun in <i>*-em</i>	Indo-Iranian, Slavic
9. Independent demonstrative pronoun <i>*so, *sā, *tho</i> (pl. <i>*th-</i>)	All except Anatolian
10. Relative pronoun:	
10a. <i>*khois</i>	Anatolian, Tocharian, Italic
10b. <i>*yos</i>	Indo-Iranian, Greek, Slavic, Phrygian
11. Comparison of adjectives in <i>*-thero-, *-is-tho-</i>	Indo-Iranian, Greek (Germanic)
12. Athematic and thematic aorists	Indo-Iranian, Greek, Armenian, Phrygian
13. Middle form:	
13a. Middle in <i>*-oi/*-moi</i>	Indo-Iranian, Greek, Baltic, Slavic, Germanic
13b. Middle in <i>*-r</i>	Anatolian, Tocharian, Italic, Celtic, Phrygian
14. Subjunctive in <i>*-ā-, *-ē-</i>	Tocharian, Italic, Celtic
15. Modal forms in <i>*-l-</i>	Anatolian, Tocharian, Armenian, Slavic
16. Middle present participle in <i>*-mo-</i>	Anatolian, Baltic, Slavic

Chronological stratification of the isoglosses found among the historical dialects must be guided by consideration of which isoglosses affect the greatest portion of the overall Proto-Indo-European linguistic territory. Isoglosses 13 (middle) and 10 (relative pronoun) each divide up the dialects into roughly identical groups, each pair of groups covering all of Proto-Indo-European. The dialectally discrepant development of the middle paradigm and the appearance of one or the other relative pronoun thus each divide the overall linguistic area into two large dialect areas. This can be considered to represent the earliest stage of Proto-Indo-European dialect division that can be posited using comparative reconstruction.

The Proto-Indo-European linguistic territory at this stage can thus be regarded as consisting of two major dialect areas: Area A, comprising Anatolian-Tocharian-Italic-Celtic, and Area B, comprising Indo-Iranian-Greek-Balto-Slavic-Germanic.¹⁷

Isoglosses 15 (modals in **-l-*) and 16 (middle present participle in **-mo-*) unite dialects which are placed in different areas by the earliest isoglosses: isogloss 15 groups Anatolian and Tocharian from early Area A together with Armenian and Slavic from B; isogloss 16 puts Anatolian from group A together with Baltic and Slavic from B. The areas that these historical dialects came from must be interpreted as having been geographically contiguous in the Proto-Indo-European territory when it was already divided into two major dialect areas. A structural trait that arose somewhere near the major dialect boundary spread across that boundary to affect a region at some distance on the other side.

The fact that there is a dialect division into two major areas with possible interaction between subareas of these is clear evidence for the geographical unity of the Indo-European linguistic territory, although certain parts of it were already opposed to each other in particular structural features. It was still a single linguistic system, subdivided into interacting dialect regions.

The first historically established split of dialect connections within the Indo-European linguistic territory can be seen in the separation and rupture of contacts between the dialect region that later gave rise to the Anatolian languages, on the one hand, and the remainder of the Proto-Indo-European area, on the other. This break can be seen in the structural innovations carried out through the entire area except for Anatolian. This is the interpretation to be given to isoglosses 1 (feminines in **-ā*, **-ī*, **-ū*), 5 (masculine instrumental plural in **-ōis*), and 9 (independent demonstrative pronoun **so*, **sā*, **tho*). They oppose Anatolian to all the other dialects, which were affected by shared innovations that did not reach Anatolian.

17. Here and below, the labels applied to the Common Indo-European dialect areas are purely arbitrary; they consist of the names of the later historically attested dialects whose comparative analysis reveals the isoglosses. Of course for these Common Indo-European dialect areas we do not assume the protosystems of the dialects which name them.

These structural innovations affecting all languages but Anatolian imply a long period of joint development of an Indo-European linguistic territory that was already subdivided into dialects but had not yet begun to split up into the historical dialects. It also indicates a long period of independent development for Anatolian, with no interaction with the other dialects. This explains the sharp divergence of the Anatolian linguistic type from the structural type of the earlier-known ancient Indo-European languages that served as a model for the Proto-Indo-European linguistic system posited by traditional theories.

In contrast to the three innovations which affected the entire Indo-European territory and spread across the boundary of the basic binary dialect division, we can detect isoglosses which make it possible to trace the further differentiation of the two basic areas. After Anatolian had split off from the Proto-Indo-European region and thus from Area A, structural innovations appeared in Area A which united all of its dialects in opposition to those of Area B. Isoglosses 2a (genitive singular in **-ī*) and 14 (subjunctive in **-ā-*, **-ē-*) point to a distinct Tocharian-Italic-Celtic dialect grouping, from which Tocharian later split off to leave an Italic-Celtic-Venetic-Messapic grouping in which isogloss 4b (dative plural in **-bhos*) then arose.

In Area B we can distinguish several isoglosses which affect almost the entire dialect area: isoglosses 6 (locative in **-s-u/*-s-i*) and 3 (instrumental singular in **-ō*), which presuppose an Indo-Iranian-Greek-Germanic-Balto-Slavic grouping.

Subsequently this area divided into more stable dialect groups in which Indo-Iranian-Greek-Armenian were united as against Balto-Slavic-Germanic. The dialect boundary is clearly reflected in the distribution of isoglosses 4a (oblique cases in **-bhi-*) and 4 (oblique cases in **-m-*), which unite respectively the Indo-Iranian-Greek-Armenian and Balto-Slavic-Germanic dialects. An Indo-Iranian-Greek-Armenian grouping at this stage can also be presumed on the evidence of isoglosses 12 (athematic and thematic aorist paradigms) and 2 (genitive singular in **-(o)syo*), which yield a clear dialect bundle that sharply circumscribes this grouping within Proto-Indo-European. Isogloss 2 is opposed in its distribution to isoglosses 2b (genitive singular in **-ō*) and 2c (genitive singular in **-eso*), which unite Balto-Slavic and Germanic.

Isoglosses 7 (genitive-locative dual in **-os*) and 8 (1sg. personal pronoun forms in **-em*) testify to the presence of shared structural features in dialects belonging to different dialect subgroups of Area B (Indo-Iranian from the Indo-Iranian-Greek-Armenian group is united with Slavic from Balto-Slavic-Germanic), and can be interpreted as reflecting geographically adjacent positions for these dialects within Indo-European. They are the result of a structural trait arising in one of the subgroups and spreading over a particular dialect territory (compare the analogous interpretation of isogloss 15 for the major areas A and

B). Isogloss 11 (superlative in **-is- θ o-*), which unites Indo-Iranian-Greek and Germanic, is to be interpreted similarly.

This inventory and interpretation of Proto-Indo-European morphological isoglosses make it possible to order the isoglosses so as to reflect the chronological sequence of structural changes which were superimposed on one another and gradually led to the fragmentation of the Indo-European speech community in time and space and the formation of the dialect groups. Table 2 shows the chronological order of the isoglosses.

Table 2
Relative chronology of morphological isoglosses

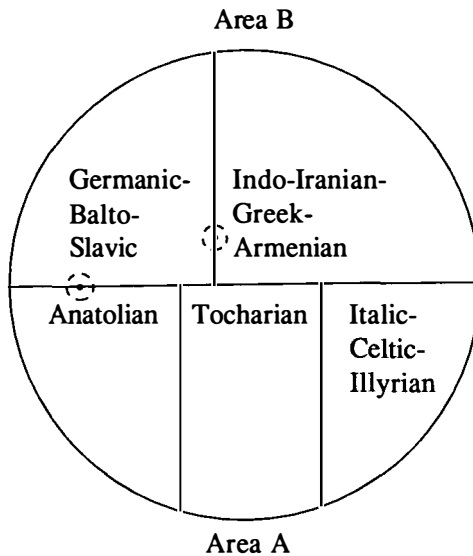
Stage	Isogloss(es)	Comment
1	13, 10	Division of Indo-European community into Areas A and B
2	15, 16	Interaction across A-B boundary
3	1, 5, 9	Innovations in A and B excluding Anatolian
4a	2a, 14	Innovations in A excluding Anatolian
4b	6, 3	Innovations over entire Area B
5a	4b	Innovations in original Area A excluding Tocharian
5b	4a, 4, 12, 2, 2b, 2c	Split of B into Indo-Iranian-Greek-Armenian and Balto-Slavic-Germanic groupings

Taking into account these isoglosses and the interpretations they presuppose, we can give a model for the spatial relations of the dialect groups within Proto-Indo-European, as shown in Figure 1. (The solid line marks the first division. Dotted circles symbolize regional isoglosses that cross dialect boundaries.)

7.3.2. Derivational-spatial model for the chronological succession of Indo-European dialect groups

The dialect division of Proto-Indo-European, proceeding by the chronological stages reflected in the ordering of isoglosses in Table 2, can be envisioned as a derivational model in the form of a tree graph. Its nodes symbolize the successive stages or chronological levels of dialect separation into distinct areal units. Interaction of dialect zones is shown by partially intersecting circles.

Figure 1



Such a model is a synthesis of the traditional 'family tree' model and the wave-theory model with its geographically interacting dialect zones. It can be called a derivational-spatial model, and is shown in Figure 2.

7.4. Phonological isoglosses in association with grammatical isoglosses as a reflex of Indo-European dialect differentiation

7.4.1. *The correlation of phonological isoglosses with the chronological levels established for the morphological isoglosses*

The chronological groupings and successive chronological stages of Indo-European dialect areas arrived at on the basis of grammatical isoglosses are largely confirmed by the phonological isoglosses arrived at through comparison of the historical dialects.¹⁸ Moreover, the phonological isoglosses make it

18. Certain resemblant phonetic phenomena of individual historical Indo-European dialects make it possible to posit dialect interaction within the Proto-Indo-European linguistic region. Resemblant rules for distribution of phonemes connected with the end of the word give evidence of such interaction. In particular, a constraint against word-final **-m* (word-final neutralization of nasals to *-n*) observed in all Indo-European dialects except Italic and Indo-Iranian can be regarded as an areal isogloss at chronological level 2 or earlier. It appears that the isogloss arose somewhere as the result of a Common Indo-European rule replacing word-final *-m* with *-n* which spread over the entire Common Indo-European territory except, apparently, the peripheral zones. Much later, Indo-Iranian and Italic arose from these peripheral zones.

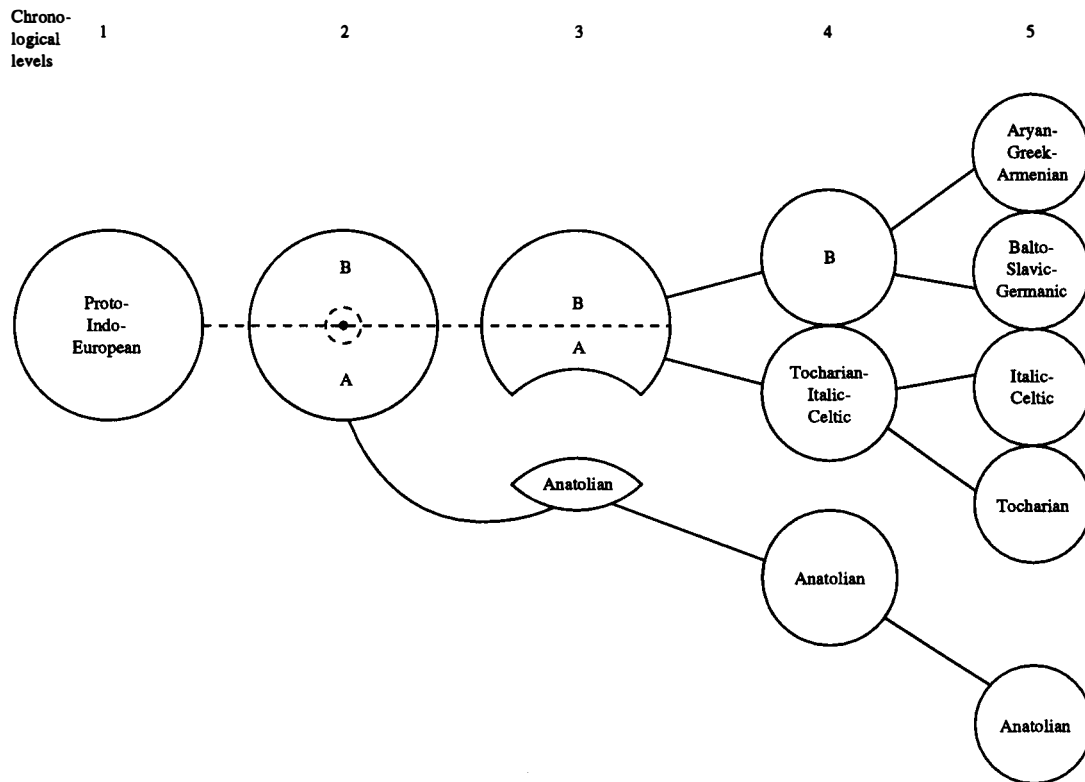


Figure 2
Spatial and derivational model for the
areal segmentation of Indo-European

possible to trace the dialects past the areas of Stage 5 (Figure 2) to the attested dialects or historically reconstructed final dialect groupings.

7.4.2. *A relative chronology of the shifts of the three stop series in the dialect groups*

The Proto-Indo-European consonant system with its three stop series (I, glottalized; II, voiced (aspirated); III, voiceless (aspirated)) underwent especially significant restructuring. The languages which preserve Series I without voicing — Germanic, Armenian, and probably Anatolian and Tocharian — can be regarded as having retained an archaism and being close to the original Indo-European system in this respect. Now, these very languages represent the isolated or peripheral regions of the Indo-European dialect territory. The archaism of Series I in these dialects is consistent with the universal of linguistic geography according to which archaic features are preserved on the periphery of an area.

The dialects in which Series I undergoes voicing (Indo-Iranian, Greek, Balto-Slavic, Albanian, Italic, Celtic) are not thereby united into a single dialect group. There is clear structural evidence that the voicing took place relatively late and independently in the attested dialects or reconstructible dialect groupings. Specifically, for Greek and Italic — which preserve the three distinct series of the original Indo-European stop system, although in a phonologically altered form — we can posit a relative chronology for the changes in the series. The voicing of the Series I ejectives must have followed the changes of Series III and II (see I.3.5.8 above), which are clearly associated with the late stages of dialect formation or the late period of reconstructible dialect groupings. Evidence of glottalization of Series I consonants can be seen in these same dialects, in particular Italic, in the phenomenon described for Latin in terms of Lachmann's Law — lengthening of vowels in certain forms (e.g. *agō* : *āctus*; see I.1.5.8 above).

That the change of the Series I ejectives was recent in the attested dialects or reconstructed groupings is shown in the patterning of grammatical isoglosses. Languages with voiceless Series I and languages with voiced Series I both occur in the same grammatically defined dialect grouping: in the Indo-Iranian-Greek-Armenian grouping, only Armenian has voiceless Series I; in the Balto-Slavic-Germanic grouping, only Germanic has voiceless series I. Obviously, the voicing of the ejectives could only have occurred when Armenian and Germanic had separated out of the groupings.

The phonetic shifts of Series II allophones in the historical dialects show the kind of diversity (devoicing in Greek and Italic, deaspiration in Balto-Slavic and

Celtic, spirantization in Germanic) that is incompatible with dialect unity (e.g. the Balto-Slavic-Germanic unity, which cannot still have existed at the time the changes took place). Moreover, even when the phonetic results are uniform, as they are for Greek and Italic or for Celtic and Balto-Slavic, the structural processes that led to these results differ significantly. The differential development of the stop series in Celtic and Balto-Slavic, despite the analogous results in the two groups, is especially revealing.

In Celtic, deaspiration of the voiced aspirates and their merger with the reflexes of the already voiced Series I obviously implies a number of complex transformations in the separate members of these series. These transformations produced the systems of the historical Celtic dialects, which are similar to the historical Balto-Slavic languages in their reflexes of Series I and II (see I.1.5.9 above).

The changes in Series III, despite the similarity of the end results in a number of dialects, are likewise to be regarded as having begun at a relatively late period in the development of the historical dialects or reconstructible dialect groupings. While we assume relatively late deaspiration of Series III in Italic and Balto-Slavic, after these dialect groups had been formed (since the reflex in Celtic is different from that in Italic, and Germanic differs from Balto-Slavic), still the deaspiration can be considered a shared process at least for Greek and Indo-Iranian, which share a number of grammatical isoglosses.

But independent deaspiration of Series III cannot be ruled out for Greek and Indo-Iranian. On this interpretation, the process can be related chronologically to the Balto-Slavic and Italic deaspirations.

In summary, the phonological alterations of the three Indo-European stop series in the historical dialects can be regarded as relatively late processes which arose at the final stages of dialect development and immediately preceded the independent formation of the dialects or reconstructible groupings.

In the Indo-European dialects we observe isolated instances where Series III phonemes are reflected as voiced stops: e.g. Skt. *píbati* 'he drinks', Lat. *bibō* '(I) drink', OIr. *ibid* 'he drinks' beside Gk. *pôthi* 'drink!', Lat. *pôtus* 'drinking' (noun), from PIE **p^hoH-*. Cf. also, for Italic-Celtic, OIr. *ab* 'river', gen. *abae*, Lat. *amnis* < **abnis* beside OPruss. *ape*, Lith. *ùpė* 'river', Skt. *āp-* 'stream'. If these isolated instances — where voicing probably arose under particular combinatory conditions — are regarded as an isogloss, then it must be an extremely ancient isogloss, uniting a number of subsequently separated dialect areas (level 2 or 3 of Figure 2). Then a voiced **b* must be regarded as a phonetic variant of the Indo-European Series III labial phoneme. Subsequently, when a phonological series of voiced unaspirated stops had appeared, this **b* naturally merged with the labial from the voiced series.

7.4.3. *Distributional patterns for stop phonemes in clusters and sequences. The dialectal and chronological correlation of these patterns*

Directly linked to the phonological transformation of Series II and III in the Indo-European dialects is the distribution of the aspirated and unaspirated allophones of the phonemes of this series, i.e. the distribution of plain voiced and voiced aspirate allophones of Series II and plain voiceless and voiceless aspirated allophones of Series III. The distribution of aspirated and unaspirated allophones of Series III can be reconstructed for the Indo-European dialects only in part — on the evidence of Germanic, Armenian, and Celtic, since in all other dialects Series III is represented by a voiceless deaspirated stop series (with the exception of Indo-Iranian and Greek, which vestigially preserve reflexes of voiceless aspirates under certain combinatory conditions).

Vestigial distributional patterns in Germanic point to an aspirated + unaspirated sequence of allophones in distant position: e.g. Goth. *(af)hvapjan* 'extinguish' (beside Gk. *kapnós* 'smoke'), Goth. *faíflōkun* 'they mourned' (beside OCS *plakati* 'weep'): see I.1.4.3 above. This distant distribution of allophones is fully consistent with their distribution in clusters in Germanic and apparently Celtic. Germanic forms such as Goth. *ahtau* 'eight', *nahts* 'night', etc., and Celtic forms such as OIr. *ocht n-* 'eight', *in-nocht* 'tonight' (beside Gk. *oktō* 'eight', *núks*, gen. *nuktós* 'night', Lat. *octō* 'eight', *nox*, gen. *noctis* 'night', etc.) are grounds for reconstructing the sequence of aspirated + unaspirated for clusters.

Since the distributional patterns for aspirated and unaspirated allophones of Series III are reflected only in Germanic, and partly in Armenian and Celtic, it is not possible to assign them a specific temporal localization and a chronological order. In other words, it is hard to determine whether it is a specifically Germanic, Armenian, and Celtic phenomenon or a pattern reflecting earlier areal phenomena. The solution to this problem depends on the distributional pattern for allophones of Series II reflected in the historical dialects, and on the positional interactions of consonants of the various series.

Germanic and Celtic have changed Series II in such a way that historical data cannot support a reconstruction of the ancient distribution of aspirated and unaspirated allophones, or make it possible to determine their ordering in distant sequences. In contrast, the Italic data can be interpreted as reflecting an allophonic ordering of aspirate plus unaspirate in non-contact sequences, as is consistent for the Series III patterning in Germanic and Celtic. If we assume isomorphy between the Series II and III distributional patterns, we can posit, with some degree of plausibility, an analogous pattern for Series II in the dialect area that gave rise to Germanic and Celtic, and an analogous pattern for Series III in the area that gave rise to Italic.

Indo-Iranian and Greek show a different picture for the distribution of Series II phonemes. For this dialect area we must reconstruct an ordering of unaspirate followed by aspirate, with traces of paradigmatic alternation which

allow us to infer a general rule for the distribution of allophones of the voiced Series II:

When two voiced consonants cooccur in the same root, one of them appears as an aspirated allophone and the other is unaspirated.

The choice of unaspirated or aspirated allophone is determined by paradigmatic conditions on the alternation. Unless there are overriding positional constraints, a Series II phoneme is usually realized as the aspirated allophone.

In the light of this rule, which can be taken back to Proto-Indo-European, the distributional pattern reconstructed for Italic and assumed for Celtic and Germanic can be regarded as an innovation which opposed these areas to the Indo-Iranian-Greek one. The innovation can be considered the result of generalization and extension to the entire paradigm of one of the allomorphs of a morpheme showing an aspiration alternation. In Italic and probably in Celtic and Germanic, the allomorph with the aspirated-unaspirated sequence was generalized to the whole paradigm, while in Indo-Iranian and Greek it is the opposite sequence of unaspirated plus aspirated that predominates (compare the opposite orderings in Skt. *babhrú-* 'brown', Lat. *fiber* 'beaver').

This innovation in Series II distribution in Italic, Celtic, and Germanic can be placed in the period when the formation of Italic-Celtic-Germanic isoglosses was still possible, i.e. when the dialect groupings A and B were still unbroken — in terms of Figure 2, at chronological level 2 or, more likely, 3.

Since Proto-Indo-European roots of the form II + III or III + II — roots containing phonemes of both Series II and Series III — do not exist, the interaction of the different series over morpheme boundaries becomes important. The sequence II + III (i.e. [voiced] + [voiceless]) at a boundary yields [voiced] + [voiced] (Indo-Iranian) or [voiceless] + [voiceless] (Germanic, Balto-Slavic, Celtic, others) under assimilation. That is, these clusters underwent assimilative changes analogous to those that can be internally reconstructed for early Indo-European roots, where II + III and III + II roots underwent assimilation to yield Proto-Indo-European II + II or III + III structures (see I.1.3.1 above). An Indo-European phoneme sequence **dh* + **th* over a morpheme boundary was realized as **dth* under the allophonic rules of Indo-Iranian, with subsequent progressive voicing assimilation (Bartholomae's Law) to *-ddh-*: **budh-* + **-tho-* → **bud-tho-* → Skt. *bud-dhá-*. This is a specifically Indo-Iranian assimilation that changed [voiced] + [voiceless aspirate] sequences into the typical Indo-Iranian sequence [voiced] + [voiced aspirate].

On the other hand, the same Indo-European sequence of [voiced (aspirate)] + [voiceless (aspirate)] across a morpheme boundary is realized as [aspirate] + [unaspirate] in dialect areas such as Germanic, Celtic, and Italic, consistent with the distributional pattern for adjacent Series II and III allophones in these dialect areas. Subsequently there is regressive assimilation in voicelessness: **gh* + **th* → **gh̥t* → **kh̥t*; cf. Goth. *daúhtar* 'daughter', OHG *tohter*, Lith. *duktė*; Lat.

lectus 'couch', OHG *lehter* 'placenta'.

A special phonetic development in individual Indo-European dialects, with regressive assimilation in voicelessness, occurs in II + III and I + III clusters of dental stops at morpheme boundaries, i.e. **dh* + **th* or **t'* + **th*. In such cases we find uniform *-ss-* in Italic, Celtic, and Germanic, and uniform *-st-* in Balto-Slavic and Greek:¹⁹

-ss-

-st-

II + III:

Lat. *iussum*, supine of *iubeō*
(from **set* into motion')

Lith. *jùsti*, inf. of *jundù* 'tremble'

Lat. *fīsus*, old ppl. in **-tho-*
from *fīdō* 'believe'

Gk. *pistós* 'reliable, true', *pústis*
'question' from *peúthomai*;

Lith. *bùsti*, inf. of *bundù* 'awaken';

OCS inf. *bljusti* 'guard';

cf. Skt. *buddhá-* 'awakened'

I + III:

Lat. *uīsus*, **-tho-* ppl. of
uideō 'see', from **wit'-thos*
(cf. Skt. ppl. *vittá-*); OIr. *fess*
'known (pl.)', *fīss* 'knowledge',
Goth. *un-wiss* 'unknown', OE
wiss, OHG *giwiss* 'known'

Gk. *á-(w)istos* 'unknown', Serbo-Cr.
vêst 'news' (cf. Russ. *iz-vest-nyj* 'known')

Lat. *ēsus* from **et'-thos*,
**-tho-* ppl. of *edō* 'eat';
cf. Skt. *átti* 'he eats'

Lith. *ėstas* 'eaten', MBulg. *jaste* 'food'

The development of these clusters in Italic-Celtic and Germanic on the one hand, and in Greek and Balto-Slavic on the other, should clearly not be traced to the very early period when these two groups were in areal unity. It is more plausibly the result of independent development when the separate historical dialects had already taken shape, and is one of the late processes in their phonological evolution.

19. In Slavic and some Baltic languages and in Germanic, **sr* develops into *str*: OCS *struja* 'stream, spurt', *ostrovŭ* 'island' ('surrounded by water', lit. 'around-flow'), Latv. *strāva* 'stream', OHG *stroum*, OIcel. *straumr* 'stream', Thrac. *Striunōn* (river name) beside Gk. *rhēō* 'I flow', Skt. *srāvati* 'it flows'; Russ. *strup* 'scab', *strup'ja* beside Gk. *rhūpos* 'filth'; OCS *sestra* 'sister', OPruss. *swestro* 'sister', Goth. *swistar*, gen. *swistrs* beside Skt. *svāsar-* 'sister'.

That the alteration of dental clusters was relatively late in Latin can be inferred from Lachmann's Law, which lengthened a preceding vowel before a glottalized consonant in a cluster (e.g. *āctus* from *agō*: see I.1.5.8 above). A similarly recent change of **-tt-* to **-st-* can be observed in Iranian as well (Avest. *vista-* beside Skt. *vittá-* 'known'). In this phonetic property the Iranian development can be compared to the analogous development in Greek and Balto-Slavic.

Thus the evolution of a dental cluster into *-st-* vs. *-ss-* does not reflect a phonetic isogloss justifying setting up separate areal groupings for these dialects. The phonetic developments arose separately in the individual dialects, after the shifts of the three Indo-European stop series in the historical dialects.

7.4.4. *A relative chronology for the changes in the three orders of posterior stops. The chronology of the formation of centum and satem groups*

The grouping of Indo-European dialects into *centum* and *satem* languages is purely classificatory. It brings historical dialects together in two large groups based on reflexes of the palatovelar series; it cannot in itself justify positing areal unity for the dialects in the two respective groups.

The two groups are the diachronic result of changes in the phonetically unstable palatovelar order. Merger of that order with the velars, and retention of the labiovelars, characterizes the *centum* languages, while in *satem* languages the palatovelars shift to affricates or spirants and the labiovelars merge with the velars. Thus in both groups the essential change was movement of the unstable palatovelar order in the system; this change triggered the chain of later transformations on which the classification is based (see I.2.3.5 above).

In determining the chronological relations of these changes we must take into account the fact that such phonetic processes are typologically natural and in principle can arise independently in different linguistic systems. Therefore the structural features involved in the *centum/satem* classification are not sufficient grounds for uniting the dialect sets into historical areal groupings. Areal unity could be posited only if several other structural features besides the basic phonetic distinction characterized the groups. On this methodological approach to the chronology of the *centum/satem* classification, the phonological merger of the palatovelars with velars in the *centum* languages must be seen as having occurred independently and at different chronological levels in the areal groupings, with the specific phonetic developments characteristic of each of the groupings.

7.4.5. The chronology of the palatovelar shift in centum dialects and the transformation of the labiovelars

Merger of the palatovelar order with the velars, as posited for the *centum* group, unites all the historical Indo-European languages from the ancient dialect area A and some from area B. This in itself points to chronological disparity of this sound shift in these dialects.

Each of the *centum* dialect regions is characterized by specific phonetic properties in the merger of palatovelars and velars, which indicates that their development was separate in these respects. The Anatolian merger already shows individual peculiarities which distinguish Anatolian from the remaining *centum* dialects. Specifically, the palatovelar-velar merger does not take place before *u*; rather, we find a combinatorily conditioned palatalized phoneme which turns into a sibilant as in Hitt. *šuwai-* 'fill', Hier. Luw. *suwa-* 'fill' (see I.2.3.2 above). This in itself precludes placing the *centum* shift at the stage of dialect unity when the two areal groupings A and B coexisted (chronological stages 2 and 3).

The Anatolian change testifies that Proto-Anatolian still had a palatovelar order which had not merged entirely with the velars; and it shows that the merger of the two series began specifically within Anatolian. Further evidence is the distinct reflexes of palatovelar **ǵh* and velar **gh* in Luwian, where they appear as respectively *Ø* and *k*: Luw. *iššari-* (Lyc. *izre* 'hand') beside Hitt. *keššar* 'hand', Gk. *kheír*, Skt. *hásta-* 'hand'.

The analogous phonetic facts from the other *centum* languages indicate that the *centum* shift is to be dated to the period of their separate existence as attested dialects or reconstructible dialect groupings. The deciding factor is the non-uniform reflexes of traces of the palatovelar order in the various dialects. This clearly indicates a recent chronology for the merger, placing it at the time when the attested dialects or reconstructible groupings had already formed.

In Tocharian, traces of palatovelars are particularly clear in the differential reflexes of **ǵh* and **gh* in positions of palatalization (Evangelisti 1950, 1959:116-17): on the one hand we have Toch. A *tsar*, B *šar* 'hand' beside Gk. *kheír*, Arm. *jeṛn*, Alb. *dórë*, Skt. *hásta-* 'hand', PIE **ǵhes-ṛ-*; on the other hand, Toch. A *špāl* 'head', Goth. *gibla* 'pediment', OHG *gebal* 'skull', Gk. *kephalḗ* 'head', PIE **ǵhebh-(e)l-*.

For Italic we have distinct reflexes of palatovelars and velars in the non-uniform treatment of **ǵh-* + *w* and **kh-* + *w* respectively in Lat. *equus* 'horse' (cf. Gk. *híppos*, Skt. *áśva-ḥ*) and Lat. *uapor* 'smoke' (cf. Gk. *kapnós* 'smoke', Lith. *kvāpas*), *cāseus* (cf. OCS *kvasŭ* 'kvass'): see I.2.3.2 above.²⁰

20. Despite the shared combinatory conditions on palatovelar and velar stops in Anatolian and Italic, the concrete phonetic realizations are different in the two systems, which shows there is no historical connection between the processes in the two historical dialects.

In the same position we have distinctions in the reflexes of palatovelars and velars in Greek as well. This can be seen in Gk. *híppos* 'horse' (dial. *íkkos*), *kapnós* 'smoke' mentioned above.

The distinct phonetic reflexes of palatovelar and velar orders in these *centum* languages cannot be reduced to a single phonetic source and therefore provide clear evidence that the palatovelar order still existed at the time when these linguistic systems had taken shape as dialect groupings. Later, in the period of their separate development, the final merger of palatovelars and velars that characterizes the *centum* classificatory group took place. Consequently, the merger of palatovelars and velars which led to the formation of the *centum* structural type in the historical period must be placed at a stage following chronological level 5 — a time when areal groupings such as Greek, Germanic, Italic, and Celtic (like the earlier-separated Anatolian and Tocharian) were already independent.

Later, when the individual *centum* dialects already existed as separate languages, there occurred a further reshaping of the velar system: loss of the phonetically unstable labiovelar order as part of the universal tendency to eliminate marked orders. In Greek, where the labiovelar order still existed in the Mycenaean period (Lejeune 1958:285-317), it was eliminated by shifting the labiovelars to labial *b*, *ph*, *p* or (in positions of palatalization) dental *d*, *th*, *t*. In Celtic an analogous tendency led to partial merger of the labiovelars with the plain velars, and the shift of **k'o* to *b* and **k'ho* to *p* in one dialect area (see I.2.2.2 above).

There is a similar development in Osco-Umbrian, where the Italic labiovelars yield labials with complete elimination of the marked labiovelar order; a tendency to shift labiovelars to labials can be traced in individual dialect forms of Latin, such as *bōs* 'bull', *lupus* 'wolf'. We also see an analogous tendency in Germanic forms such as Goth. *fimf* 'five', *wulfs* 'wolf', *af-lifnan* 'stay' (with later progressive assimilation).²¹

In contrast, there is another group of *centum* dialects where the marked labiovelar order was eliminated by segmentation into a velar proper plus a labial element *-w-* or *-u-* with the status of sonant or vowel. This kind of simplifica-

21. The type of progressive assimilation found in forms with labiovelars, whereby they turn into labials, is opposed to a chronologically earlier pattern of regressive assimilative change of a labial into a labiovelar, from Italic (see Pisani 1957b) and Celtic: Lat. *quīque* 'five', OIr. *cóic* 'five' (from **pʰenkʰoe* 'five', cf. Skt. *pāñca*, Gk. *pénē* 'five'); Lat. *coquō* 'I cook' (from **pʰekʰo-*, cf. Skt. *pácati* 'cooks, bakes'); Lat. *quercus* 'oak' (from **pʰerkʰo-*, cf. Lith. *perkūnas* 'thunder', *perkūnija* 'thunderstorm'). This process may reflect a shared Italic-Celtic isogloss going back to the time when a relatively stable labiovelar order existed in a three-order system of posterior consonants, before the *centum* shift began. The early forms with two labiovelars due to assimilation underlie later cognates such as Osco-Umr. **pompe-* 'five' (Osc. *pumperias*, Umr. *pumpetias*), Gaul. *pempe-*, OWelsh *pimp* 'five', Welsh *pobi* 'bake, cook'. Thus the Germanic, Osco-Umbrian, and Celtic forms with two labials, similar in the end results of their development, reflect entirely different evolutionary processes.

tion of the labiovelar order — which evidently took place independently at a relatively late period in the history of each of the dialects — can be seen in Hittite and Tocharian and in part in Greek (in forms lacking vowels, as in *kúklos* ‘wheel’, *núks* ‘night’, etc.): Hitt. 3sg. *kuenzi* ‘he beats, kills’, 3pl. *kunanzi* ‘they kill’ beside Skt. 3sg. *hánti*, 3pl. *ghnánti*, from PIE **ghoen-thi*, **ghon-onthi*; cf. Toch. A *yuk* ‘horse’ (B *yakwe*), Lat. *equus*, Gk. *hippos*, Skt. *ásva-* (see van Brock 1972); Toch. A *kukäl* ‘chariot’ (B *kokale*; cf. the same development in Gk. *kúklos* beside Skt. *cakrá-* ‘wheel’); Toch. A *kum-* ‘come’ (B *kām-*), cf. Goth. *qiman* ‘come’ beside Gk. *baínō* ‘(I) go’, Skt. *gácchāmi* ‘(I) go’, etc.

7.4.6. *The chronology of the palatovelar shift in satem dialects. The rise of affricates and transformation of the fricative system*

At approximately the same time that the *centum* shift took place in the individual historical dialects, the *satem* shift — elimination of the marked palatovelar order by shifting it to affricates or spirants — took place in the other dialect group. A number of phonetic innovations accompanying this change, which reveal phonetic similarities among the independent *satem* dialects, are evidence for the areal unity of the dialects belonging to the *satem* group. (In contrast, the languages of the *centum* group underwent their diagnostic shifts independently at some stage in their development.)

These facts make it possible to distinguish a period later than level 5 in the breakup of the Indo-European linguistic community. At this stage there is a split into the individual dialect units in which the *centum* shift was taking place at about the same time, and a split into the interacting Indo-Iranian-Armenian, Balto-Slavic, and Albanian dialect areas in which the *satem* shift took place. A shared phonetic innovation which accompanied the *satem* shift and hence testifies to areal unity for that shift — i.e. a diagnostic phonetic innovation unifying all the *satem* dialects — is the merger of a sibilant reflex of the palatovelar phoneme with a reflex of one of the sibilant phonemes. This isogloss unites what were essentially two basic dialect areas of the *satem* group (see I.2.3.3).

7.4.7. *Neutralization of the palatovelar-velar opposition in dialects of the satem group*

Certain discrepancies among the individual areas of the *satem* group can be observed in the choice of positions where the opposition of velar and palatovelar phonemes was neutralized. In Baltic and Slavic, alternations of the two phoneme types within one morpheme are attested in doublets such as Lith.

akmuō 'stone' : *ašmuō*, pl. *āšmens* 'blade' (cf. Gk. *ákmōn* 'anvil', Skt. *ásman-* 'stone'); Lith. *kárvė* 'cow' : *stirna* 'roe deer' (a Slavic loan according to Trubačev 1973:305), Russ. *korova* 'cow' : *serna* 'chamois'. These pairs reflect, in general form, an ancient Indo-European alternation of palatovelar and velar phonemes within the paradigm under combinatory conditions that cannot be more precisely defined.

The alternation may have been the consequence of neutralization of the palatovelar-velar opposition in these positions. Traces of this alternation in Proto-Indo-European can also be found in the existence in various *satem* dialects of cognate forms differing in whether they reflect palatovelar or velar phonemes:

OCS *svekry* 'husband's mother' in contrast to Lith. *šėšuras* 'husband's father', Skt. *śvaśrū-* 'husband's mother', *śváśura-* 'husband's father', Arm. *skesur*.

Lith. *smākras* 'chin', Alb. *mjékër*, Arm. *mawruk*, Skt. *śmāsru-* 'beard', etc. (see I.2.3.4 above).

These forms must be viewed as paradigmatic levelings which generalized one member of ancient pairs of Proto-Indo-European paradigmatically alternating allomorphs, where one allomorph had a palatovelar phoneme and the other a velar. Judging from the absence of assibilation of palatovelars in forms like the above from *satem* languages, one such position of neutralization of the palatovelar-velar opposition may have been the position before certain sonants: liquids **r*, **l* and nasals **m* and **n*.

Traces of this Common Indo-European morphophonological opposition are preserved as relics in *satem* dialects which assibilated the reflexes of the Indo-European palatovelars; they have of course been completely obliterated in the *centum* languages, where the palatovelars merge with the velars (except for Anatolian, where in one position — before *u* — there is *satem*-like assibilation of an old palatovelar).

Evidence for an unpalatalized Indo-European phoneme in a position of neutralization can be seen in Indo-Iranian, in forms such as Skt. *digdhāḥ* 'anointed' beside *deh-* 'anoint', Arm. *diz-anem* '(I) put together, compose' (cf. Lat. *fiŋgō* '(I) mold, shape', Gk. *teikhos* 'wall', etc., PIE **d^heiǵh-*);²² Skt. aor. *āvākṣam* 'I conveyed, rode' beside *vāhati* 'he conveys, rides' (cf. Lat. *uehō* '(I) convey', PIE **weǵh-/wog^h-s- ~ *we/oG^h-*).

Thus the evidence for such morphological alternations in the *satem* languages reflects an ancient feature of Indo-European, dating from the period of unity of the historical dialects, *satem* and *centum* alike.

22. Strictly speaking, the Indo-European morpheme should be reconstructed as two paradigmatically alternating allomorphs, **d^heiǵh-/d^heiǵh-*, or at least as **d^heiG^h-* (with **G^h* an archiphoneme in Trubetzkoy's sense).

7.4.8. The chronology of the shift of the labiovelars in the satem languages

Assibilation of the palatovelars in the *satem* languages necessarily resulted in a system with two stop orders, velar and labiovelar — the same two-order system produced in the *centum* languages by the merger of the palatovelars with the velars. As shown above, in the *centum* languages the labiovelar order was subsequently eliminated through various phonetic innovations. An analogous phonetic alteration of the labiovelars must be posited for the *satem* group immediately before the individual *satem* dialects formed. Evidence for the labiovelar order can be traced fairly clearly in the historical *satem* dialects, which have altered it by various phonetic means.

First of all, a distinct order going back to the labiovelars and contrasting with the velars in the *satem* languages can be detected in the non-uniform reflexes of these two orders in positions of palatalization. In Sanskrit the labiovelars are reflected in positions of palatalization as *j* (Skt. *jāni-h* ‘woman’, Avest. *Jaini-* beside Goth. *qinō*, Gk. *guné* ‘woman’), *h* (Skt. *hāras-* ‘dust’ beside Gk. *théros* ‘summer’), and *c* (*pāñca* ‘five’, Avest. *panča* beside Lat. *quīnque*), which are distinct phonemes from the reflexes of the velars proper. This is direct evidence for the existence of two opposed velar orders in the early period of Indo-Iranian areal unity.

Distinctions in the reflexes of these series in palatalizing environments are also found in Armenian (Arm. *Jer* ‘warmth’, *Jerm* ‘warm’ beside Gk. *théros* ‘summer’, *thermós* ‘warm’; Arm. *č’ork’* ‘four’, Lat. *quattuor* ‘four’, Myc. Gk. *qe-to-ro-* ‘four’) and Albanian (Alb. *zónjë* ‘woman’ beside Goth. *qinō* ‘woman’, Alb. *ndez* ‘(I) kindle, set afire’ beside Lat. *foueō* ‘(I) blaze, flame’): see I.2.2.3 above.

The vocalization of syllabic sonants adjacent to consonants of these two orders is an essential factor in establishing the phonological character of this order (which is opposed to velars in the *satem* languages) and in determining its chronology. Vocalization of syllabic sonant reflexes with *u* quality adjacent to phonemes going back to labiovelars is a direct reflex in some *satem* languages of the labialization feature of the labiovelar. This gives grounds for considering the labiovelar order to have existed in the *satem* dialect system, contrasting with the velars proper, at the time when the syllabic sonants were vocalized. Evidence of such labialization can be seen in Sanskrit forms such as *gūrtá-* ‘welcome’ (from **k’oṛ̥th-*), cf. Lat. *grātus* ‘pleasant’, Osc. *brateis*; Skt. *gurú-* ‘heavy’ (from **k’oṛru-*), cf. Lat. *grauis*, Gk. *barús* ‘heavy’ (see I.2.2.3 above).

Fairly clear examples of analogous vocalization can be observed in Iranian: Avest. *puxda-* (from **pṇkoto-*: van Brock 1972:271), cf. Gk. *pémptos* ‘fifth’, Osc. *pomptis* ‘quinquies’, and also Lith. *kùmsťė* < **kùmpstė* < **pumkoste* ‘fist’ (see Fraenkel 1962:I.309-10).

In view of these facts it can be claimed that after the shift of the phonologically marked palatovelar order to affricates and fricatives, the *satem* languages preserved two opposed consonant orders inherited from Proto-Indo-European: velar and labiovelar. In this respect the *satem* system of that period coincided structurally with the *centum* system, where the posterior phonemes were likewise represented by two opposed orders, the velars (comprising the velars proper and the palatovelars of Indo-European) and the labiovelars.

The further evolution of the stop subsystems of the *centum* and *satem* languages for the most part shows only chronological differences. In the *satem* languages there is a further merger of the labiovelars with the velars which produces a single order of velars due to loss of labialization in the labiovelars. This process obviously occurred prior to the formation of the historically attested languages belonging to the *satem* classificatory group. In the historical languages we can observe only isolated traces of the labiovelar order.

In the *centum* languages the elimination of the labiovelars and formation of a single velar order took place significantly later, within the histories of the individual languages, and it involved phonologization of the labialization feature into a separate segment and hence simplification of the original labiovelars.

7.4.9. Reflexes of syllabic sonants in the various dialect groups and the chronologization of sonant vocalization

The merger of the labiovelar and velar series in the *satem* languages occurred in the prehistory of the individual *satem* dialects but can nonetheless be localized in time as having followed the vocalization of syllabic sonants, since, as was shown above, the vocalized sonants preserve evidence of the presence of labiovelars in *satem* dialects.

Based on the nature of the vocalization and the particular phoneme sequences formed in the historical dialects, we can distinguish particular dialect areas where vocalization of short sonants, and sometimes also long sonants, had similar results (see I.3.2.3, I.3.2.4 above). We can set up clearly delimited Indo-Iranian-Greek, Balto-Slavic-Germanic, Italic-Celtic, Tocharian, and Anatolian areas with specific reflexes of syllabic sonants characteristic of each area. We thus have grounds for positing historical shared dialect development in these areas at some stage. The dialect areas distinguished by the vocalization of syllabic sonants coincide almost entirely with those established on morphological grounds for chronological level 5, which supports our conclusion that the similar phonetic results of vocalization were areal phonetic isoglosses.

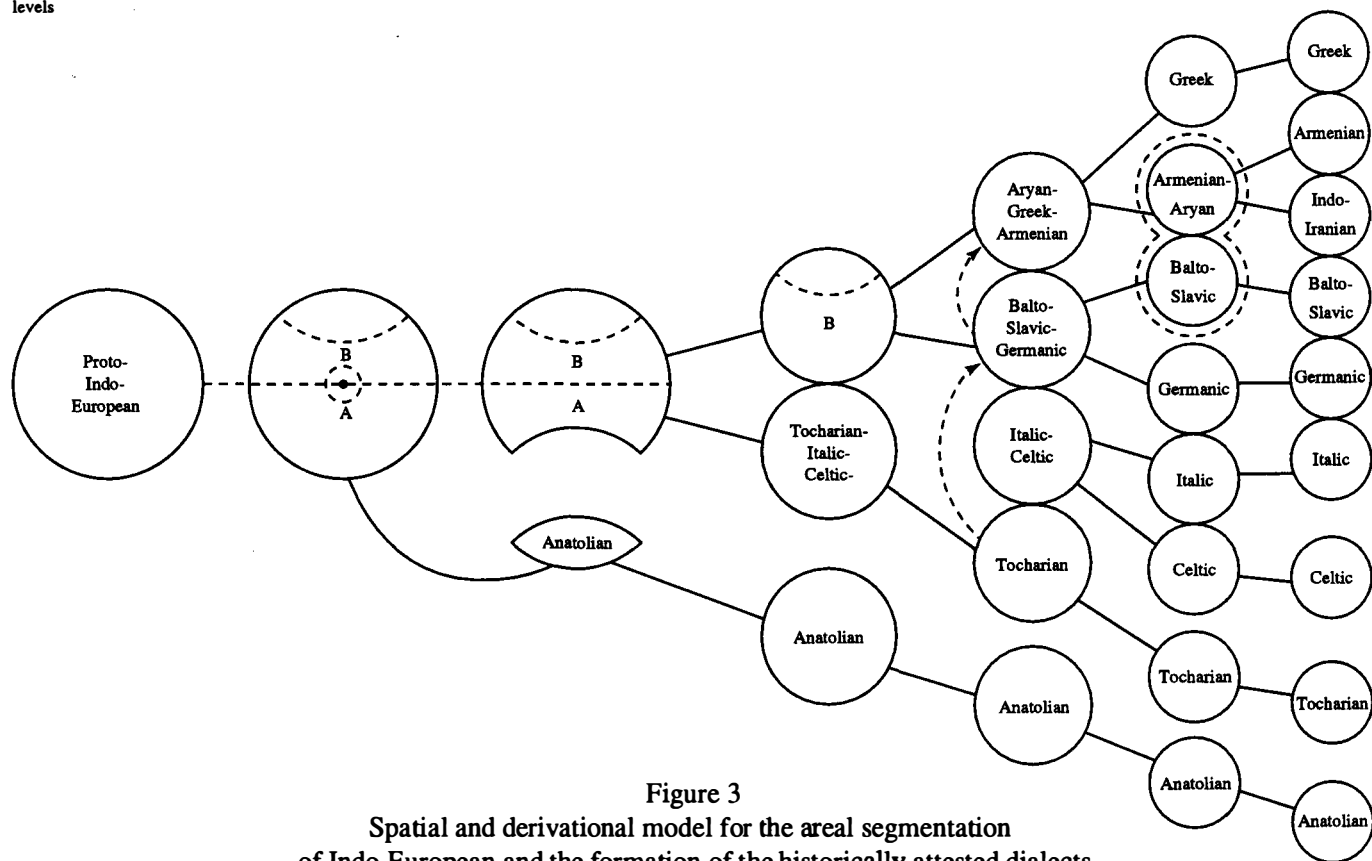


Figure 3
Spatial and derivational model for the areal segmentation
of Indo-European and the formation of the historically attested dialects

7.4.10. *The stages in the formation of the historical Indo-European dialects as final chronological levels in the areal-genetic model of Indo-European dialect division*

If we date the vocalization of syllabic sonants to chronological level 5 in the development of the Indo-European dialects, the *satem* shift of palatovelars and the subsequent merger of labiovelars with velars must be placed at a stage following level 5 — at a level 6, where the *satem* isogloss appeared to unite the *satem*²³ dialects in an areal grouping, or an even later level 7, when the historical Indo-European dialects took shape as linguistic units with new geographical interactions and connections which led to later contacts (e.g. Anatolian and Greek, Anatolian and Armenian) and borrowings.

The phonologically and grammatically based areal chronology for Indo-European dialect differentiation given above can be presented as the areal-genetic model shown in Figure 3. This pattern is an extension of that given in Figure 2 above to the historically attested stage of Indo-European dialect division, level 7.24

7.5. Lexical isoglosses as a reflection of the dialect division of the Indo-European linguistic community

7.5.1. *The chronological sequence of dialect areas based on lexical isoglosses, in relation to grammatical and phonological isoglosses*

Lexical isoglosses established for the historical Indo-European dialects (like the grammatical and phonological isoglosses surveyed above) provide grounds for assuming areal groupings of dialects in the history of Common Indo-European, groupings from which the historical dialects subsequently formed.

It is extremely significant that the areal groupings distinguished on the basis of lexical isoglosses coincide overall with those based on morphological and phonological isoglosses. This is unambiguous evidence for the historical reality of the dialect areas of Indo-European, which can be distinguished on the strength of the agreement of a whole complex of grammatical, phonological, and lexical data.

23. Probably also pertaining to the same chronological level are other phonetic phenomena, such as an isogloss opposing Indo-Iranian-Baltic to Italic-Celtic in length of the sonant in forms such as Skt. *vīrá-* 'man', Lat. *uir* 'man'.

24. The models for the final levels 6 and 7 do not show dialects such as Albanian and ancient Balkan dialects, although data from them are taken into consideration in the analysis of isoglosses in the historical dialects. Their absence from the model is due to the fact that we do not have sufficient morphological information to determine their place in the preceding chronological levels: see Pisani 1959a, b.

7.5.2. Lexical isoglosses within the satem dialect grouping. Indo-Iranian-Balto-Slavic lexical isoglosses

It is relatively easy to discern, on lexical evidence, closely interacting areas of *satem* languages which coincide with the Armenian-Indo-Iranian and Balto-Slavic areas of chronological level 6 (Figure 3) established on phonological criteria. There are a number of lexical forms characteristic of only these groups of dialects:

Skt. *śyāvā-* 'black-brown, bay, dark', Avest. **syāva-* 'black' (personal name *Siiāuuāspi-* 'black-horsed': Mayrhofer 1979:I.75), Lith. *šývas* 'gray-white', OCS *sivŭ* 'gray' (horse color).

Skt. *kṛṣṇā-* 'black', OPruss. *kirsnan*, OCS *črŭnŭ* 'black', Russ. *čěrnyj*.

Skt. *māra-* 'death', Lith. *māras*, OCS *morŭ* 'death' (death from epidemic).

Skt. *tucchyā-* 'empty', Lith. *tùščias*, OCS *tŭšŭ*, Russ. *toščij* 'skinny'.

Skt. *ati-réka-* 'remnant', Lith. *ātlaikas*, OCS *otŭ-lěkŭ*.

Skt. *dakṣiṇā-* 'right', Avest. *dašina-*, Lith. *dėšinas*, OCS *desnŭ* 'right' (beside different derivatives of the same root in other dialects: Gk. *deksiterós* 'right', Lat. *dexter* 'right', Osc. *destrst* 'to the right').

Skt. *ajā-* 'goat', *ajāna-m* 'hide, pelt', OPers. *azak* 'goat', Lith. *ožys* 'goat', adj. *ožinis*, OCS (*j*)*azno* 'leather', Alb. *dhi* 'goat' (Albanian is closely attached to this dialect region both lexically and phonologically).

7.5.3. Indo-Iranian-Greek-Armenian lexical isoglosses

A distinct group of lexical isoglosses sets off areal groupings coinciding with the grammatical and phonological areas of level 5. This group consists primarily of thematic nominals, which suggests a relatively recent areal character for these words (see Porzig 1964:241-42):

Skt. *hāras-* 'heat', *ghṛṇā-* '(intense) heat', Gk. *théros* 'summer', Arm. *jer* 'warm'.

Skt. *mārta-* 'mortal; person', Avest. *marəta-* 'person', Gk. *mortós* · *ánthrōpos*, *thnētós* 'person; mortal' (Hesychius), Arm. *mard* 'person' (see Thieme 1952).

Skt. *jārant-* 'old; old man', Avest. *zarəta-* 'old, infirm', Osset. *zæronđ* 'old', Gk. *gérōn*, gen. *gérontos* 'old man', Arm. *cer* 'old; old man'.

Skt. *stāna-* 'breast', Avest. *fštāna-*, Gk. *stēnion* · *stēthos* 'breast' (Hesychius), Arm. *stin* 'breast' (cf. initial **sph* in the cognates of other dialects: OE *spanu*, etc.: Pokorny 1959:990).

Avest. *izaēna-* 'made of leather', Gk. *áiγ-* 'goat', Arm. *ayc* 'goat'.

7.5.4. Balto-Slavic-Germanic lexical isoglosses

Chronologically at the same level 5 are lexical isoglosses which coincide with the morphologically and phonologically delimited Balto-Slavic-Germanic dialect grouping (see Stang 1972):

Lith. *aldijà*, *eldijà* ‘canoe’, OCS *aldi(ji)*, *ladi(ji)* ‘boat’, Norw. dial. *olda*, OE *ealdop*, *aldaht* ‘vessel’.

Lith. *birginti* ‘be greedy, keep for oneself’, OCS *ne-brěgq* ‘(I) disregard, scorn’, Russ. *berěč* ‘save, take care’, Goth. *baírgan* ‘keep, preserve’.

Lith. *blandūs* ‘unclean, dim’, OCS *blędq* ‘(I) wander, err’, *blędū* ‘lechery’, Goth. *blandan sik* ‘mix, be mixed’, *blinds* ‘blind’.

Lith. *dabà* ‘nature, character’, *dabnūs* ‘beautiful’, OCS *dobrŭ* ‘good’, Goth. *gadaban* ‘correspond’.

Lith. *dailýti* ‘divide’, OCS *dělitī* ‘divide’, Goth. *dails* ‘part’, *dailjan* ‘divide’.

Lith. *daūg* ‘much’, Russ. *djužij* ‘hefty’, Pol. *dużo* ‘much’, Goth. *daug* ‘it is useful, it profits’, Ger. *taugen* ‘be fitting’.

Lith. *draūgas* ‘friend’, OCS *drugŭ* ‘friend’, Russ. *drug* ‘friend’, *družina* ‘detachment, retinue’, Goth. *driugan* ‘serve in army’, *gadraūhts* ‘warrior’.

Lith. *glėbti* ‘embrace’, Russ. *ogloblja* ‘shaft’, OIcel. *klafi* ‘manger for cows’.

Latv. *grebt* ‘dig out’, OCS *po-grebq* ‘thapteín’, Russ. *grebu* ‘sweep, row’, *vygrebaju* ‘rake out’.

Lith. *jaū* ‘already’, OCS *(j)u(že)*, Goth. *ju* ‘already’.

OPruss. *kails* ‘hello’, *kailŭstiskan* ‘health’, OCS *cělŭ* ‘healthy, whole’, OE *hāl*, OIcel. *heill*.

OPruss. *camus* ‘bumblebee’, Lith. *kamānė*, Russ. *šmel’*, OHG *humbal*.

Lith. *šeimà* ‘family’, Latv. *sàime* ‘extended family’, Russ. *sem’ja* ‘family’, Goth. *haims* ‘village’, OE *hām* ‘home’.

Lith. *liáudis* ‘people’, Russ. *ljud* ‘person’, *ljudi* ‘people’, OHG *liut* ‘people’.

Lith. *maišas* ‘large bag’, OCS *měxŭ*, Russ. *mex* ‘fur’, pl. *mexá*, alternate plural *mexí* ‘bellows’, OIcel. *meiss* ‘basket’.

Latv. *nāve* ‘death’, Russ. *nav* ‘ghost of dead person’, Goth. *naus* ‘dead person’.

OCS *pęstī* ‘fist’, Russ. *pjast’* ‘metacarpus’, OHG *fŭst* ‘fist’, Ger. *Faust*, cf. Lith. *kŭmstė* < **pumkostė* ‘fist’.

Lith. *rugiaī* (pl.) ‘rye’, ORuss. *r”ž*, Russ. *rož* ‘rye’, OIcel. *rugr*.

Lith. *sidābras* ‘silver’, Russ. *serebro* ‘silver’, OCS *sĭrebro*, Goth. *silubr*.

Lith. *slābnas* ‘weak’, OCS *slabŭ* ‘weak’, OIcel. *slápr* ‘lazy person’ (the **sl-* cluster distinguishes this dialect word from Lat. *labor*).

Lith. *tūkstantis* ‘thousand’, Latv. *tūkstuōts*, OPruss. *tūsimtons*, OCS *tysęšti*, Russ. *tysjača*, Goth. *pūsundi*.

Lith. *žel̃tas* ‘golden’, Latv. *zēl̃ts* ‘gold’, Russ. *zoloto*, OCS *zlato*, Goth. *gulf* (the suffix *-*tho-* distinguishes this word from Skt. *hīraṇya-* ‘gold’); see also

Porzig 1964:209-10.

Lith. *įsnaiga*, *snaigala* 'snow', OPruss. *snaygis*, OCS *sněgŭ*, Russ. *sneg*, Goth. *snaiws* 'snow' (the **o* grade distinguishes this thematic formation from forms with zero grade elsewhere in Indo-European: Lat. *nix* 'snow', Gk. acc. *nípha*): see Fraenkel 1962-1965:II.851.

Lith. *gīrnos* 'millstones' (fem. pl.), Latv. *dziņrus*, OPruss. *girnōywis*, Russ. *žernov*, OCS *žrŭny*.

7.5.5. Italic-Celtic lexical isoglosses

Another dialect union based on lexical isoglosses and coinciding with the morphologically and phonologically based areal groupings at chronological level 5 is the Italic-Celtic dialect area. Unlike lexical isoglosses which include Tocharian and pertain to an earlier chronological level, these unite only Italic and Celtic (see Porzig 1964:150-58):

Lat. *terra* 'earth' (from **tersā*), adj. *terrestris* 'terrestrial', Osc. *teerúm* 'earth', OIr. *úr* 'region', Welsh *tir* 'earth'; etymologically 'dry land', cf. PIE **thers-* 'dry out', Gk. *térsomai* '(I) will dry', Skt. *tṛṣyati* 'he is thirsty'. The development of the meaning 'earth' from a Common Indo-European word meaning 'dry' is characteristic only of Italic and Celtic.

Lat. *uēlum* 'linen; cover', dim. *uexillum* 'banner', OIr. *figim* '(I) weave', Welsh *gweu* 'weave', OWelsh *gweetic* 'textilis'.

Lat. *solium* 'throne', OIr. *suide* 'seat', *-*yo-* derivative of **set-* 'sit' with **o* vocalism: **sot'-yo-(m)*; the meaning 'seat, throne' in a derivative of this type from this stem is found only in Italic and Celtic.

Lat. *trāns* 'across', Umbr. *traf*, *tra* (from **trā*), Welsh *tra-* (from **thrāns*) 'across', cf. OIr. *tar* 'over, beyond'. A specifically Italic-Celtic derivative of PIE **therH-* 'cross, penetrate, defeat', preserved in the other dialects, cf. Skt. *táratī* 'penetrates'.

Lat. *dē* 'from', OIr. *dí*, OWelsh *di*, Corn. *the*, Bret. *di* (Sommerfelt 1920). In this semantic function these elements are characteristic only of Italic-Celtic.

The latter two isoglosses are particularly revealing in that they are lexicogrammatical in nature, reflecting both grammatical and semantic innovations in a particular dialect area, in this case Italic-Celtic, as distinct from the other dialect areas (see Watkins 1966:35-36). Such lexicogrammatical isoglosses also include the superlative formations mentioned above.

Lat. *dē-sēs* 'lazy, idle' (< **dē-sed-*), OIr. *deīd* 'lazy', *deëss* 'idleness'. This meaning for this ancient compound with **dē* is represented only in Italic-Celtic.

Lat. *saeculum* 'century, generation', Welsh *hoedl*, OBret. *hoetl* 'century, life'.

Lat. *bīlis* 'bile', Welsh *bustl*, OCor. *bistel*, Bret. *bestl* 'bile'.

7.5.6. *Lexical isoglosses correlated with the basic dialect groups of chronological level 5*

The lexical isoglosses surveyed above, testifying both to lexical innovations in particular dialect areas and to shared semantic innovations in the inherited lexicon, justify delimiting Indo-Iranian-Greek-Armenian, Balto-Slavic-Germanic, and Italic-Celtic dialect areas which correlate with chronological level 5 in the sequence of stages in the dialect division of Proto-Indo-European. This chronological correlation is fully consistent with the later phonetic reflexes of the Indo-European palatovelars represented in the isoglosses surveyed above, which distinguish Indo-Iranian-Greek-Armenian and Balto-Slavic-Germanic dialect areas.

Regular *centum-satem* correlations reflected in these isoglosses, such as Skt. *járant-* 'old man', Arm. *cer* 'old', Gk. *gérōn* or Avest. *izaēna-* 'of leather', Arm. *ayc* 'goat', Gk. *aíks* 'goat', on the one hand, and Lith. *šeimà* 'family', Russ. *sem'ja*, OE *hām* 'home' or Lith. *želtas* 'golden', Russ. *zoloto*, Goth. *gulþ* 'gold', on the other, are direct evidence for the existence of a palatovelar series at the time when these lexical innovations arose in the respective dialect areas.

Assibilation of the palatovelar series took place, as shown above, at chronological level 6, and this justifies associating the areal groupings posited above with level 5, where — on the joint evidence of morphological, phonetic, and lexical isoglosses — such dialect groupings as Indo-Iranian-Greek-Armenian, Balto-Slavic-Germanic, Italic-Celtic, and presumably Tocharian were distinguished.²⁵

25. The isoglosses surveyed above that pertain to the pre-*satem* period, i.e. to level 5, can be opposed by the phonetic criterion of assibilation to lexical innovations representing interdialectal borrowings and showing *centum* traits in *satem* dialects or *satem* traits in *centum* dialects. The latter forms provide clear evidence for late interaction, after the assibilation of palatovelars and the *satem* shift, i.e. after level 6. Such lexical forms, testifying to relatively late interaction of individual dialects, include the following. *Centum* forms in *satem* languages: Lith. *kiēmas* 'village, yard', *kāimas* 'yard', OPruss. *caymis* 'village' beside Goth. *haims* 'village', OE *hām* 'home, yard' (cf. the forms from the same root cited above, which reflect earlier interaction prior to level 6: Lith. *šeimà* 'family'; but see Stang 1972:28 for a different explanation); Lith. *pēkus*, OPruss. *pecku* 'livestock' beside Goth. *faþhu* 'possessions', OHG *fihu* 'livestock'. *Satem* forms in *centum* languages: Gk. *sarsai* · *hōmnaksai* (Hesychius), Lat. *sarracum* 'carriage of foreign type' (cf. Lat. *currus* < **kʰys-o-*, with regular *centum* reflex of the palatovelar).

It is easy to see that these and similar recent interactions among individual dialects involve *satem* forms in *centum* dialects and vice versa. Of course this survey excludes all forms from *satem* dialects with unassibilated palatovelars which are due to neutralization of the palatalization opposition, as in the Balto-Slavic word reflected in Lith. *kárvė* 'cow', Russ. *korova*, or Lith. *akmuō* 'stone'. These forms reflect the early Indo-European period when three posterior stop orders existed (for this see 1.2.3.4 above).

7.5.7. Interareal interaction among the level 5 dialect groups

The dialect areas of level 5 were not isolated from each other, but had some interaction, as is reflected in the existence of a number of shared lexical innovations found in each of these groupings. The dialect areas must have been in some situation of spatial contact at some stage; this obviously indicates a common geographical range. At the chronological level in question they constituted separate dialect groupings within the common Indo-European linguistic territory. Evidence for interareal interaction at level 5 are lexical isoglosses such as Tocharian-Germanic-Balto-Slavic, Italic-Celtic-Germanic, Italic-Celtic-Germanic-Balto-Slavic, etc.

7.5.8. Balto-Slavic-Germanic-Italic-Celtic lexical isoglosses

Especially intense contacts at level 5 can be found between the Balto-Slavic-Germanic and Italic-Celtic dialect areas. A long list of cognates can be adduced with lexical isoglosses reflecting close historical interaction between these areas (see Meillet 1922:17ff.):

Lith. *raūdas* 'red', OCS *rudŭ* 'red', Goth. *rauþs*, Lat. dial. *rūfus*, *rōbus*, Umbr. *rofu* (acc. pl.), OIr. *rúad*, Welsh *rhudd*. A shared innovation of these areas is the shift of the word to a thematic stem without *-r-*, cf. Gk. *eruthrós*, Toch. B *ratre*, Skt. *rudhirá-* 'bloody', reflecting a Proto-Indo-European stem in **-r-*.

Lith. *veikiù* 'I work', *apveikiù* 'I subjugate', OCS *věkü* 'strength', Goth. *weihan* 'fight', OE *wīgan* 'fight', Lat. *uincō* 'I defeat', Osc. *uincter* 'defeats', OIr. *fích-* 'fight, struggle'; opposed to the semantically identical word in Indo-Iranian-Greek, Skt. *jáyati* 'defeats', Gk. *bíā* 'violence'.

Lith. *žirnis* (masc.) 'grain', OPrus. *syrne* 'grain', OCS *zrīno* 'grain', Russ. *zerno*, Lat. *grānum* 'grain', OIr. *grán* 'grain'.

OPruss. *mealde* 'lightning', Latv. *milna* 'hammer of thundergod Perkunas', OCS *mlŭnījŭ*, Russ. *molnija*, OIcel. *mjǫllnir* 'hammer of thundergod Thor', Welsh *mellt* (pl.) 'lightning'.

Lith. *óbuolas* 'apple', OCS *ablŭko* 'apple', OIcel. *epli*, OIr. *ubull*, cf. Oscan city name *Abella* (Vergil, Aeneid 7.740): Stang 1972:68, Porzig 1964:290.

Lith. *bedù* 'dig', OCS *bodq* 'sting, stab', Goth. *badi* 'bed', Lat. *fodiō* 'I dig', *fossa* 'ditch', Gaul. *bedo-* 'canal'.

Lith. *mārės* (pl.) 'marsh; sea', OCS *morje* 'sea', Goth. *marei*, Lat. *mare*, OIr. *muir*.

Lith. *barzdà* 'beard', OCS *brada* 'beard', OHG *bart*, Lat. *barba* 'beard'.

Lith. *vařdas* 'name', Latv. *vārds* 'name, word', Goth. *waúrd* 'word', Lat.

uerbum 'word'.

OCS *věra* 'faith', OHG *wār* 'true', Lat. *uērus* 'true', OIr. *fír* 'true'.

OCS *sěmę* 'seed', Lith. *sėmenys* 'seed', OHG *sāmo* 'seed', Lat. *sēmen* (nominal derivatives in **-men* of the Proto-Indo-European root **sē-* 'sow', cf. Hitt. *šai-* 'press in, sow').

Russ. *bórošno* 'variety of millet', Goth. *barizeins* 'of barley', OE *bære* 'barley', Lat. *far* 'spelt' (*Triticum spelta* L.), Osc. *far* 'spelt'.

Russ. *piskar'*, Pol. *piskorz* 'gudgeon', Goth. *fisks* 'fish', Lat. *piscis*, OIr. *íasc* 'fish'.²⁶

7.5.9. Tocharian-Italic-Celtic-Germanic-Balto-Slavic isoglosses

The Tocharian area shows a number of words shared with Italic-Celtic and Balto-Slavic-Germanic:

Toch. B *walo*, A *wäl*, obl. *lānt-* 'king', OIr. *fal-n-* 'rule, reign', *flaith* 'prince', Welsh *gwlad*, Bret. *gloat* 'country', Lat. *ualeō* 'I am strong', Osc. *ualaemom* 'best'. Also belonging to this isogloss is a stem extended by suffixed **-dh-*: Goth. *waldan* 'govern', Lith. *vėldu* 'I rule, own', OCS *vladq* 'I rule, own'.

Toch. A, B *kronše* 'bee', Lat. *crābrō* 'hornet' together with OHG *hurnŭz*, *hornaz* 'hornet', Lith. *širšė*, Russ. *šeršen* 'hornet'.

7.5.10. Lexical isoglosses reflecting dialect interaction at chronological level 3. Lexical isoglosses uniting Tocharian with the Indo-Iranian-Greek-Armenian and Balto-Slavic-Germanic areas

Toch. A *se* 'son', B *soy* 'son', Gk. *huiós* 'son', Hom. gen. *huiéos* (cf. Arm. *ustr* 'son' by analogy to *dustr* 'daughter': Pokorny 1959:914; the isogloss would thus also include the Armenian region). All other areas except Italic-Celtic also have a form with suffixal **-n-*: Skt. *sūnú-* 'son' (beside *sūtá-* 'son'), Avest. *hunu-*,

26. In contrast to the word groups cited above, shared lexemes found in two historical dialects such as Italic and Germanic or Germanic and Celtic form lexical isoglosses which may reflect interaction among these dialects at a much later chronological level, in the period of their separate existence. Isoglosses of this type include such lexical pairs as Lat. *annus* 'year' (from **athnos*), Osc. *akenel*, Umbr. *acnu* 'year' beside Goth. dat. pl. *aþnam* 'years'; Lat. *haedus* 'goat' beside Goth. *gaitis* 'goat'; Lat. *labium* 'lip' beside OE *lipa* 'lip'; Lat. *tacēre* 'keep quiet' beside Goth. *þahan* 'keep quiet'; or Gaul. *rēda* 'four-wheeled carriage', OIr. *dériad* 'two-horse carriage' beside Oícel. *reið* 'ride; carriage'; OIr. *lár* 'earthen floor; threshing floor' beside Oícel. *flórr* 'floor of cow stall', OE *flōr* 'floor', etc. The fact that these forms have regular consonant correspondences shows that they arose before the alteration of the three stop series, which was one of the last phonetic and phonological processes in the formation of the historically attested systems of these dialects.

Goth. *sunus* 'son', Lith. *sūnūs*, OCS *synŭ*. Interestingly, this word is completely absent from the Italic-Celtic area in the meaning 'son', which is expressed there by derivatives of other roots: Lat. *filius* 'son' (Umbr. *feliuf* 'those who nurse, suckle'), OIr. *macc* 'son'.

Toch. A *orkām* 'gloom, darkness', Gk. *orphanós* 'dark', possibly with more distant connections to Skt. *rajanī* 'night', Arm. *erek* 'evening', Goth. *riqis* 'darkness' (Benveniste 1959:104, Porzig 1964:269-70, Pokorny 1959:857).

7.5.11. Tocharian-Greek-Indo-Iranian-Germanic-Balto-Slavic lexical isoglosses

Toch. A *kam*, B *keme* 'tooth', Alb. *dhëmb*, Latv. *zùobs*, Russ. *zub* 'tooth' beside Skt. *jāmbha-* 'canine tooth (of predator)', Gk. *gómphos* 'bolt, dowel', OHG *kamb* 'comb'.

Toch. B *wāp-* 'weave', Alb. *venj* 'I weave', Gk. *huphaínō* 'I weave', OHG *weban* 'weave' beside Skt. *ubhnāti* 'he ties'.

Toch. A *swase*, B *swese* 'rain', Gk. *húei* 'it rains', Alb. *shi* 'rain', OPruss. *suge* 'rain'.

When the lexical isoglosses correlated with dialect groupings at chronological level 3 are analyzed, intense interaction of the Tocharian area with Indo-Iranian-Greek-Armenian and Balto-Slavic-Germanic, and a lack of lexical connections to Italic-Celtic, stand out. The lack of isoglosses between Tocharian and Italic-Celtic, which at other chronological levels comprise one dialect grouping, is clear evidence for a shift of dialect areas within the Indo-European linguistic community at level 3. Earlier dialect connections that also include Italic-Celtic obviously reflect a Common Indo-European stage prior to such migrations:

Toch. B *tek-* 'touch', Lat. *tangō*, *tetigī*, *tāctum*, OLat. *tagō* 'I touch', OIr. *tais* 'soft', OE *ðaccian* 'touch lightly', Gk. *tetagōn* 'having caught, grasped'.

Toch. A, B *plāk-* 'be in agreement', A *plākām* 'permission', B *plāki* 'agreement', Lat. *placeō* 'I please', *placidus* 'even, soft, peaceful' together with OIcel. *flaga* 'fine layer of earth', Lith. *plākanas* 'even, flat', Gk. *pláks* 'plain'.

Toch. A, B *āre* 'plow', Lat. *arō* 'plow' (noun), *arāre* (verb), OIr. *airim* 'I plow' together with Goth. *arjan* 'plow', Lith. *ariù* 'I plow', OCS *orjŭ* 'I plow', Gk. *aróō* 'I plow', Arm. *arawr* 'plow'.

Toch. A *mañ* 'month', B *meñe* 'month', Lat. *mēnsis* 'month', Umbr. *menzne* 'mense', OIr. *mí* (from **mēns*), gen. *mís* (from **mēnsos*) together with Goth. *mēna* 'moon', Lith. *mėnuo* 'moon, month', Ion. Gk. *meís*, Dor. *mēs* 'month' (from **mēns*), *mēñē*, Arm. *amis* 'month' (from **mēnsos*), Alb. *múaj* 'month' (< **mōn-*).

Note that the Anatolian area does not participate in these isoglosses. This permits them to be located at level 3, where areas A and B were in interaction

while the area from which Anatolian later formed had already completely separated off.

Note also the complete absence of Indo-Iranian lexemes among these isoglosses.²⁷ Lexical innovations which apparently arose in the A-B dialect community at level 3 or 4 did not extend to the part of area B which much later gave rise to Indo-Iranian, nor, possibly, to other adjacent regions. This distinction shows that the region in question was already somewhat isolated in the A-B community. Isolation of the Indo-Iranian region in B is also evident in the presence of feminine numeral forms specific to the Indo-Iranian dialect, e.g. Skt. *tisráḥ* 'three' (fem.), Avest. *tišrō*, Skt. *cátasrah* 'four' (fem.), Avest. *čataŋrō* beside OIr. *téoir* 'three', *cethéoir* 'four' (fem.).

This isogloss affects exclusively Indo-Iranian, not Greek and Armenian, which makes it unlikely that it pertains to level 5 and moves it back to level 4 or 3, the period when the category of feminine gender was forming.

7.5.12. *Lexical isoglosses reflecting dialect interaction within Proto-Indo-European at level 2*

Isolation of the dialect area from which Indo-Iranian later arose can also be posited for the Proto-Indo-European dialect zone at level 2. An extremely significant set of lexical isoglosses includes Anatolian and the other Indo-European dialects but does not affect Indo-Iranian:

Luw. *u(wa)lant-* 'death', *ulantalli-* 'mortal' (cf. Hier. Luw. *walatali-* 'mortal': Laroche 1959a:104): Toch. A *wäl-* 'die', *walu* 'dead', OIr. *fuil* 'blood', Welsh *gweli* 'wound' beside Oícel. *valr* 'those killed in battle', Lith. *vėlės* 'souls of the dead' (Stang 1972:62); cf. Gk. *Ēlúsiōn* (*pedíōn*) 'Elysian fields' (other words from the same root have the analogous meaning of the abode of the dead: Puhvel 1969).

Hitt. *lagari* 'he lies', Toch. A *lāk-* 'lie', *lake* 'couch, camp', B *leke*, Lat. *lectus* 'couch', OIr. *lige* 'bed', Goth. *ligan* 'lie', Gk. *lékhetai* · *koimātai* (Hesychius), *léktron* 'couch', Alb. *lágje* 'quarter, (city) block'.

Hitt. *ḫuwant-* 'wind', Toch. A *want*, B *yente* 'wind', Lat. *uentus*, Welsh *gwynt* 'wind', Goth. *winds* 'wind' (a derivative in **-nth-[o]-* with the specialized meaning 'wind' is an innovation for the entire zone except in Indo-Iranian, where 'wind' is a different derivative of the same root, and in Balto-Slavic: Skt. *vāta-ḥ* 'wind', Lith. *vėtra* 'storm', OCS *větrŭ* 'wind').

These glosses must be dated to level 2, since Anatolian participates in them.

27. The form **mēs-* 'moon', attested in Indo-Iranian, appears to be an archaism in comparison to **mēn-* or **mēns-* from the same root; the latter stem spreads over all of the A-B area except for Indo-Iranian and probably Slavic (cf. **mēs-ŋ-ko-* > Russ. *mesjac* 'month, moon', etc.).

An Anatolian lexeme showing a regular correspondence to a lexeme of even one Indo-European dialect is automatically to be projected to level 2 — that is, it belongs to the Proto-Indo-European system of the time prior to the complete removal of the Anatolian area at level 3 (see Figure 3). It is this factor that makes the lexical data of Hittite so significant for reconstructing Proto-Indo-European at the stage when all dialects were still part of the original community.

However, level 2 was not necessarily characterized by dialect unity, as was established above in the analysis of grammatical isoglosses. Lexical units reconstructed for level 2 show dialect distinctions which in a number of instances coincide overall with the division into areas A and B, but which also occasionally yield specific lexical groupings reflected as archaisms in the historical Indo-European dialects (for details see Gusmani 1968).

A dialect union of Anatolian with Tocharian and certain other dialects at level 2, essentially coinciding with dialect area A, can be seen in a number of lexical isoglosses:

Hitt. *ištark-* ‘be sick’, Toch. B *sark* ‘disease’, OIr. *serg* ‘disease’ together with Lith. *sergù, siřgti* ‘be sick’.

Hitt. *eku-/aku-* ‘drink’, Toch. A, B *yok-* ‘drink’, Lat. *aqua* ‘water’ as well as Goth. *ahva* ‘stream, waters’. The word is opposed to another stem **phoH-* with the same meaning, which appears primarily in the dialects of area B (except Germanic): Skt. *píbatí* ‘drinks’, Gk. *pínō* ‘I drink’, Arm. *əmpem* ‘I drink’, Alb. *pi* ‘drink’, OPruss. *poieiti* ‘drinks’, OCS *pijǫ* ‘I drink’ beside parallel use of both stems in Italic-Celtic: Lat. *bibō* ‘I drink’, OIr. *ibid* ‘drinks’.

Hitt.-Luw. *tarna-* ‘skull’, Toch. B *tarne* ‘upper part of head; top of head’ (Poetto 1976).

In addition to the binary division of the Proto-Indo-European linguistic region into the two major areas A and B, as established by the joint evidence of grammatical and lexical data, smaller dialect divisions can be posited which comprised smaller groups of languages. Such isoglosses can be illustrated with isolated correspondences such as Hitt. *dalugašti-* ‘length’ beside Pol. *długość* ‘length’, Czech *dlouhý* ‘long’ (see Porzig 1964:278-79); Hitt. *-tala-* (agentive noun suffix) beside Common Slavic **-telǫ* (agentive noun suffix), opposed to **-ther* in analogous formations in other Indo-European languages (see Benveniste 1948).

7.5.13. Grammatical, phonological, and lexical isoglosses as reflecting the original stage of Indo-European dialect division

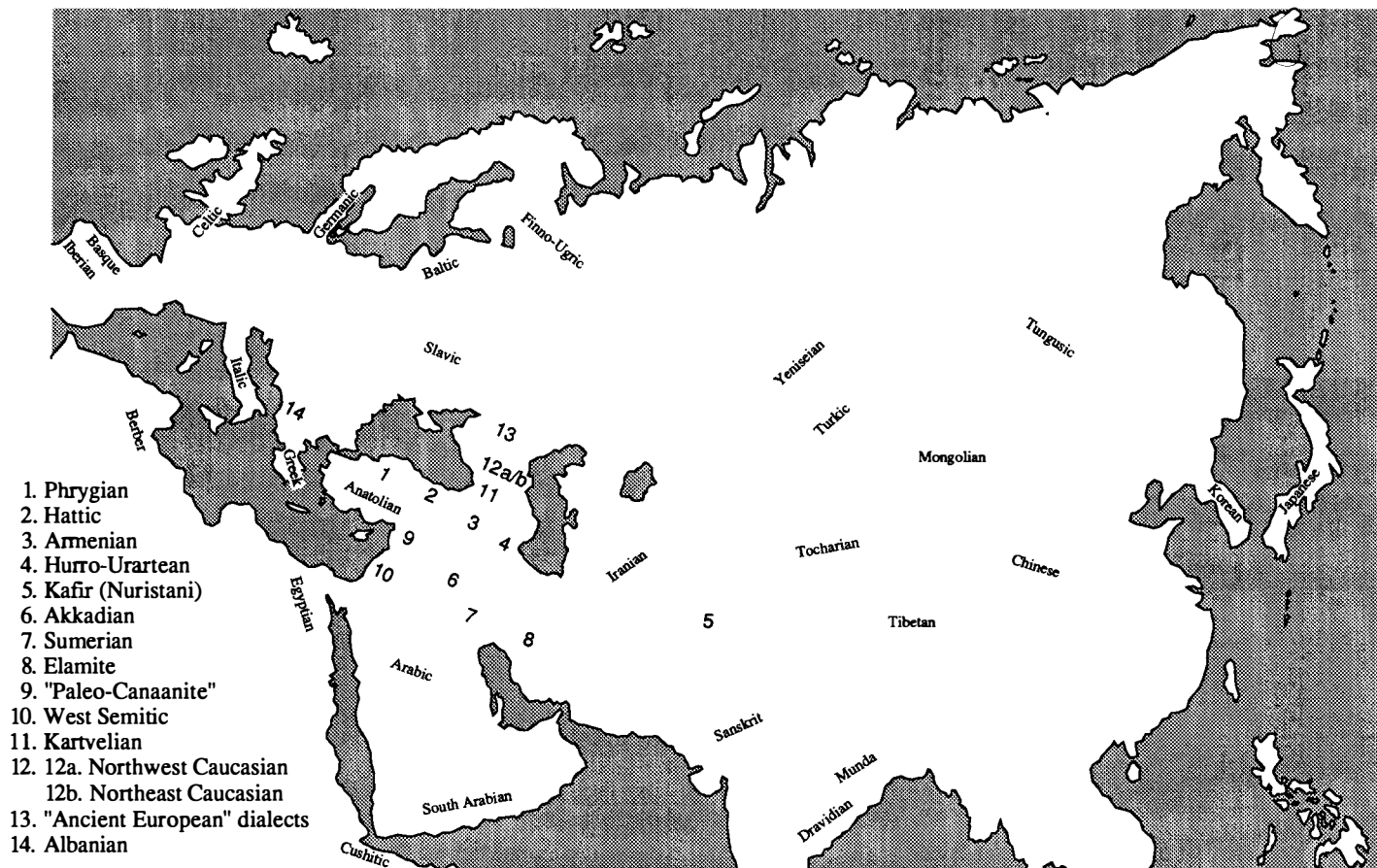
The grammatical, phonological, and lexical isoglosses established for the attested Indo-European dialects make possible comparative reconstruction of the stages

whereby Common Indo-European broke up into the dialect groups which developed into the historical Indo-European dialects. A picture of the development can be reconstructed by moving backward from later stages to earlier ones until we reach a stage reflecting linguistic unity (with some dialect divisions). Further movement back to still earlier stages is possible only by means of internal reconstruction, as was done above for the early stages of Proto-Indo-European in regard to its phonological, morphological, and syntactic structure.

7.5.14. Geographical relations of the Indo-European and non-Indo-European languages of Eurasia

The areal division of Common Indo-European into dialect groupings and then into separate dialects ultimately produced the individual Indo-European languages which spread throughout the Eurasian continent in historical times. The geographical distribution of these languages relative to each other and to languages of other families was the result of complex historical processes which led to the regrouping of originally adjacent dialects of Proto-Indo-European.

The written documents of these languages make it possible to establish their earliest distribution in Eurasia in historical times and to give a general picture of their geographical interaction with non-Indo-European languages of adjacent areas (see Map 1). The map shows the major groups of Indo-European languages and languages of other families in contact with them as they have been distributed over Eurasia in various historical periods. The map does not depict the areal distribution at one particular historical period, but places them in space in their historical positions on the Eurasian continent. It is a schema for the relative positioning of languages (and primarily protolanguages) and a projection of the locations established for various languages at various times onto a single spatial level. It can be thought of as several maps, each reflecting the distribution of languages at a particular historical period, united in a single spatiotemporal arrangement.



Distribution of languages and language families in Eurasia

Part Two

↪
**Semantic Dictionary of Proto-
Indo-European
and
Reconstruction of Indo-European
Proto-Culture**

The apocryphal epilogue which the editors of Saussure's Cours added in italics: "The true and unique object of linguistics is language studied in and for itself" is to be rejected by the present-day linguistics. We conceive today of language as a whole "in and for itself" and simultaneously as a constituent part of culture and society.

Roman Jakobson

C'est, en dernière analyse, seulement le côté pittoresque d'une langue, celui qui fait qu'elle diffère de toutes autres comme appartenant à certain peuple ayant certaines origines, c'est ce côté presque ethnographique qui conserve pour moi un intérêt ...

Ultimately it is only the pictorial aspect of a language, whereby it differs from all others in belonging to a certain people having certain origins, the almost ethnographic aspect, that holds interest for me...

Ferdinand de Saussure
Letter to Antoine Meillet
January 4, 1894

Introduction

Methods for reconstructing the semantic dictionary of a protolanguage and the linguistic paleontology of culture

0.1. The dialectal and pan-dialectal lexicon as the basis for reconstructing the semantic lexicon of the protolanguage

The picture of Indo-European areal relations drawn from the study of grammatical, phonological, and lexical isoglosses among the Indo-European dialects provides a way of determining how dialectal differentiation of the protolanguage proceeded and hence of establishing what contacts took place among speakers of the dialects. In other words, purely linguistic facts make it possible to establish extralinguistic factors such as historical interactions among speakers of particular dialects.

Of particular value and significance for linguistically based reconstruction of non-linguistic historical and social relations is formal semantic analysis of the dialect lexicons, since they can reflect all essential aspects of the historical existence of their speakers. Under the heading of the historical existence of speakers will be included the ecological environment (fauna, flora, geographical surroundings, climate) and human habitat and migration in that environment, as well as culture in the broadest sense (including both material and intellectual culture). Semantic reconstruction of relevant lexemes from the daughter languages gives us a general representation (although sometimes only a fragmentary one) of the speakers' historical existence. In such reconstructions, linguistic facts are a source of information on prehistoric culture and its historical evolution

0.2. The correlation of reconstructed lexical semantics with the real world

Reconstructing elements of the extralinguistic world of speakers of related dialects in turn gives a clearer picture of the linguistic relations among these dialects and their development in time, i.e. of purely linguistic factors. This is particularly true of the semantic structure of language, which simply cannot be studied in isolation from the external world that is reflected in the content plane

of language (cf. the logical term 'strong semantics'). For a formally reconstructed lexeme the proto-meaning often cannot be established without going beyond strictly linguistic facts and bringing in typological data on the history of the cultural domains involved. For example, for the Proto-Indo-European base **H₂ay₂es-*, whose reflexes in the daughter languages mean variously 'copper', 'bronze', and 'iron', we reconstruct the prehistoric meaning 'copper', not 'bronze' and especially not 'iron', since the period of Indo-European linguistic unity coincides with the Copper Age.

The analysis of language as closely linked to its speakers' culture was developed during the early stages of Indo-European studies. The classical figures in Indo-European comparative linguistics, such as Jacob Grimm, pointed out the need for joint analysis of language and culture.¹ This trend produced studies, dating to the mid- and especially late 19th century, which have remained significant to the present day. Such investigations were often called, after Pictet (1859-1863), 'linguistic paleontology', a subdiscipline analyzing ancient Indo-European culture on the basis of linguistic data.² The well-known book of Schrader (Schrader/Nehring 1917-1923, 1929) summarized a century's investigations in this area.

The Saussurean principle of studying language 'in and for itself' became standard in the subsequent decades, causing a decline in language-and-culture studies and narrowing the focus of linguists' attention to the structure of language. This restriction to structure alone has begun to shift, in the past two decades, to the study of language viewed as a product of human culture, in close linkage with culture and with the history of its speakers as a frame of reference.

This development entails that the study and reconstruction of lexical semantics and the distribution of lexemes among the daughter languages are of particular importance to the structure and history of Indo-European. The lexemes themselves, once we have reconstructed their original Proto-Indo-European semantics, give direct evidence for ecological and cultural characteristics of the environments of the daughter languages. Such evidence gives us a first approximation to aspects of material and spiritual culture and points to changes in their environment brought on by migrations of speakers of these dialects. Comparison of formally matching words from the daughter languages and their attested meanings yields reconstructions of both protoforms and proto-

1. A revealing quote from Grimm: *Sprachforschung, der ich anhänge und von der ich ausgehe, hat mich nie in der Weise befriedigen können, dass ich nicht immer gern von den Wörtern zu den Sachen gelangt wäre; ich wollte nicht bloss Häuser bauen, sondern auch darin wohnen.* "Linguistics, which I am engaged in and which is my point of departure, has never been able to satisfy me to such an extent that I was not always eager to get beyond the words to the things [they denote]; I wanted not only to build houses but also to live in them."

2. This trend in linguistics might better be called 'linguistic cultural paleontology', since its object of investigation is not the protolanguage but the protoculture of the speakers; what is reconstructed is not so much the language itself as the extralinguistic world reflected in the linguistic data.

semantics. These lexical archetypes may go back to Common Indo-European times and be posited for the Common Indo-European linguistic system; or they may belong to later chronological layers reflecting dialect groupings within the protolanguage.

Comparing the reconstructed forms and meanings makes it possible to discern lexicosemantic fields. These fields define sets of semantically grouped lexemes which designate extralinguistic classes such as animals, plants, construction and dwellings, handcraft tools, and others.³ The study of semantic fields reveals striking differences in the lexical stability of individual lexemes, depending on whether their primary usage was nominal or verbal. For example, the ancient nouns referring to various kinds of tools undergo frequent semantic shifts in the individual daughter languages as technology and production evolve, which often complicates reconstruction of the original form of a word, while the verbs, with their less specific terminological meaning, display greater stability.

0.3. Semantic lexicon and reconstruction of culture

Common Indo-European lexemes naturally reflect the general features of the environment, material existence, and culture of the speakers of the daughter dialects. These same lexemes provide the oldest lexical stratum of Proto-Indo-European and its separate branches. The following chapters give a classificatory lexicon of Indo-European semantemes by individual semantic fields, bringing in whatever information about the possible historical denotata of these lexemes is essential to shed light on the ecological environment and culture type of the speakers of the daughter dialects.

The Proto-Indo-European lexicosemantic system can be reconstructed through comparison of cognate forms in the daughter languages. When we compare this system with extralinguistic reality we obtain an approximation to a general picture of the economy, material culture, and social organization of the ancient Indo-Europeans, the speakers of Proto-Indo-European or its dialect groupings. The posited general picture can be given historical reality through typological comparison with actual cultures of the past and present. This is a typological verification of a reconstructed culture against attested cultures. In

3. Establishing such lexicosemantic fields for the protolanguage makes possible a conclusion, extremely important for phonetic correspondences among etymologically related words, about the possibility of departures from regular sound correspondences. Such departures can be observed in words from the semantic fields of animal terms and body-part terms. This can be explained by the frequent deformation of words in these lexical fields due to euphemism and tabu. This fact necessitates a special provision in the Neogrammarian principle of exceptionless sound laws, as can further be illustrated by many examples of individual words from particular semantic groups.

verifying a reconstructed culture, and in particular its material side, archeological data which demonstrates the typological plausibility of the reconstructed material culture takes on particular significance.

0.4. Reconstructing ritual and mythological elements and text fragments

Reconstructed Proto-Indo-European lexemes are shown in the semantic lexicon presented in the following chapters together with the mythological and ritual motifs their referents participate in. This kind of lexical organization makes it possible to move from the words and their referents to the comparative analysis of mythological and ritual motifs and to the reconstruction of semantic archetypes for mythological and ritual elements which go back to Proto-Indo-European times, as well as to the description of their transformations in separate historical Indo-European traditions.

The reconstruction of common mythological and ritual elements is a purely semantic reconstruction which in principle can be independent of the particular words describing these elements in attested historical traditions. In practice, however, mythic and ritual elements established for individual traditions and going back to Proto-Indo-European models are attested in texts which frequently contain etymologically related words or even whole expressions. This further testifies to the common origin of mythic and ritual elements that illustrate the conceptual and spiritual culture of the Proto-Indo-European speakers. In addition, it enables us to reconstruct not only words with their meanings but also fragments of proto-text, i.e. sections of text longer than a word. These fragments provide examples of Indo-European word-level syntagmatics, arrived at not by combining words reconstructed in isolation (an example of which is Schleicher's well-known fable), but by directly reconstructing entire fragments of text on the strength of etymologically identical phrases, expressions, and compounds in the daughter traditions. They enable us to reconstruct in broad outline the spiritual culture of the Indo-Europeans and their conceptions of the world around them, their classification of natural phenomena and their views about humans and human society.

0.5. The Indo-European semantic lexicon as a reflection of proto-culture

The comparative semantic analysis of words from separate Indo-European daughter languages and text fragments in separate daughter traditions, together with the method that may be called 'linguistic cultural paleontology', makes it

possible to reconstruct a semantic lexicon of the protolanguage and a general picture of the protoculture of the speakers of the protolanguage or its dialect groups.⁴ This points to a possible Proto-Indo-European homeland and suggests routes of migration by which speakers of the protolanguage or its dialects may have reached their historical territories.

4. This semantic dictionary, unlike Buck's well-known semantic dictionary of synonyms (1949), is organized as a series of semantemes expressed by proto-wordforms (cf. Hallig and von Wartburg 1963). The semantic dictionary of Indo-European reconstructions is thus in essence an Indo-European etymological dictionary with the lexemes ordered not alphabetically but by semantic groups.

Section One

Semantic Dictionary of Proto-Indo-European

Chapter One

The living world: Gods, people, animals

1.1. The ancient Indo-European taxonomization of the living world. Taxonomic distinctive features

1.1.1. The class of living things and its name

In the earliest Indo-European tradition the class of all living things is denoted by a generic term which goes back to the root **k'oī-*, **k'oei-* and comprises both plants and animals. In various branches this root forms lexemes with the meaning 'living', 'life', as well as terms for the whole floral and faunal classes:

'Live, life': Skt. *jīvā-* 'alive, life', Av. *jva-* 'alive', Gk. *bíos* 'life', Lith. *gývas* 'alive', OCS *živŭ*, Lat. *uīuus* 'alive', OIr. *biu, beo*, Goth. *qius* 'alive': PIE **k'oīw-*.

'Animal': Gk. *zōion* 'animal' (beside *zōós* 'alive'), ORuss. *život'* 'animal'.

'Person, living being': Gaul. *Bitu-rīges* 'People of the World King' (Pokorný 1959:468), Av. *gaēθā-* 'creature, living being; world, humanity' (= 'collection of living beings'), e.g. in *dātarə gaēθanəm astvaitnəm* 'O creator of the material worlds' (Yašt 14, 42).

That this term extended to plants is shown by Skt. *jīva-gṛbh-* 'one who seizes plants' (Grassmann 1873:492), OE *cwice* 'couch-grass, quitch-grass', OCS *žito* 'grain' (cf. OPruss. *geits* 'bread', etc.).

This entire class can be characterized with the semantic feature [+living.]

1.1.2. The features animate and inanimate. Two classes of animacy

Within the living world there are two subclasses: the animal world (in the broad sense, including people), with the semantic feature [+animate], and the plant world, characterized by inanimacy [-animate]. The animacy characteristic of the animal world is evident in terms that link the meanings 'breathe', 'spirit', 'soul' with words for animals, people, and gods, while plant names lack such elements. Animals, like people, were conceived of as beings with breath or spirit.¹ These

1. A typological analog to the equation of 'animate' with 'breathing', 'having breath, soul' can be found in the Northwest Caucasian designation of animals and humans as 'animate, breathing', a term derived from *psə* 'soul, breath' (Jakovlev and Ašxamaf 1941:219, Šakryl 1971:80).

etymological links can be established on the evidence of many of the oldest Indo-European dialects.

The root **dheu-H/s-* ~ **dhu-H/s-* had as its original meanings ‘blow’, ‘exhale’, ‘gasp’, ‘asphyxia’, ‘breath’, ‘breathing’, as shown in Hitt. *tuhḫai-* ‘gasp’, *tuhḫiyaz*, *tuhḫima-* ‘asthma, asphyxia’, Gk. *thūmós* ‘soul, passion’ (Sullivan 1980), Skt. *dhūmāḥ*, Lat. *fūmus*, Lith. *dūmai*, OPruss. *dumis* (‘smoke’: Roider 1981), *Dumones* ‘priests who use smoke for divination’ (Toporov 1975:I.390), OCS *dymŭ*, OHG *toum*, Mlr. *dumacha* (pl.) ‘fog’. The *-s-* stem is attested in OCS *dyxati* ‘breathe’, *duxŭ*, *duša* ‘breath, soul’, Lith. *dūsėti* ‘cough’, *dūsauti* ‘inhale’, *dvėsti* ‘expire, exhale’, *dvasià* ‘breath, spirit’. This stem forms names for animals and gods in a number of ancient dialects: Goth. *dius* ‘wild animal’, Olcel. *dýr* ‘wild quadruped’, OHG *tior* ‘animal’, OE *dēor* ‘wild animal’, Alb. *dash* ‘ram, sheep’; possibly Lat. *bēstia*, *bellua* ‘wild animal, monster’, with phonetic transformation of the initial consonant; Gk. *theós* ‘god’ (see Pokorny 1959:269).

The same association of the meanings ‘breathe’, ‘inhale’, ‘soul’ with ‘animal’ is shown by another group of archaic lexemes which reflect the same subdivision of the living world into animate and inanimate classes: PIE **anH-*: Skt. *ániti* ‘breathes’, *ánila-ḥ* ‘breath’, Gk. *ánemos* ‘breath, wind’, Goth. *uz-anan* ‘exhale’, Olcel. *andi* ‘breath, soul’, Lat. *anima* ‘breath, soul’, OIr. *ánál* ‘breath’, *anim(m)* ‘soul’, Toch. A, B *āñme* ‘oneself, ipse’, OCS *vonja* ‘odor’, beside Lat. *animal* ‘animal’, Toch. B *onolme* ‘living being, animal’ (for more on these concepts in the Greek and Latin traditions see Onians 1954).

The existence of two Indo-European lexemes for ‘breathe, breath’, **dheu-* and **anH-*, suggests that they may originally have had different shades of meaning. Since the first root has historically attested meanings ‘gasp’, ‘pant’, ‘breathe with difficulty’, ‘expire’ while the second does not, it may be that the first meant ‘exhale’ (and naturally acquired the meanings ‘asphyxia’, ‘last breath’, ‘death’)² while the second meant ‘inhale’ (and hence developed the meanings ‘odor’, ‘smell’). The generic term for animate beings in the ancient Indo-European tradition may have been formed from these two roots.

If the animacy (‘breathing’) of animals in the ancient Indo-European tradition is revealed in the regular etymological connection of ‘breath, spirit, soul’ with ‘animal’ in the earliest dialects, it is also illustrated in ancient texts, which often attribute souls to animals: e.g. the Avestan ‘Hymn of the soul of cattle’ (Yasna 29, 1ff.): *xšmaibyā gəuš urvā gərəždā* ‘the Soul (*urvan-*, Pers. *ravān*) of Cattle calls on you (sc. heavenly dwellers), groaning’.

2. Cf. the Old Hittite use (in KBo VII 14 I 5-6) of *tuhḫiyatt-* in the sense ‘asphyxia’ in relation to bears and humans: *nu-tta ḫartaggan man [...]* *nu-tuhḫiyattit akti* ‘I will [...] you like a bear and you will smother’ (lit. ‘die of asphyxia’).

1.1.3. The animal and plant worlds and the terms for them

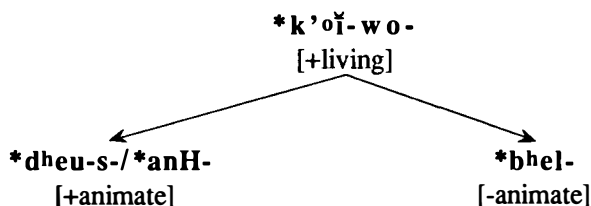
The division of the living class in earliest Proto-Indo-European into animal and plant subclasses, based on the semantic feature of animacy, is shown by the fact that certain verb forms required animate arguments and others required inanimate arguments. To some extent this is a continuation of the even more ancient Pre-Indo-European division of nominals into active and inactive classes. It is significant that words denoting the animate subclass coincide for the most part with the older class of actives, a subclass in the binary division of the nominal system into active vs. inactive; while names of plants, particularly trees, coincide as a rule with the ancient inactive class (subsequently often interpreted as feminine gender, see 1.5.1.3 above).

The oldest Indo-European dialects testify to the original pairing of verbal doublets based on the animacy or inanimacy of their nominal argument. The verbal pair ***Hwes-** and ***bheuH-/bhuH-**, whose shared semantic core was 'be, exist, become', are associated with animate and inanimate subclasses respectively. ***bheuH-** (Skt. *bhāvati* 'becomes, ripens', Gk. *phúō* 'become, grow', Lat. *fuī* 'was', etc.) originally combined with plant names, as is particularly clear from early dialect reflexes of derivatives with the meaning 'plant', 'vegetation': Gk. *phutón* 'vegetation, plant, growth', Arm. *boys*, gen. *busoy* 'sprout, plant', OCS *bylĭje* 'plant', OIcel. *bygg* 'barley', OSax. *bewō* (gen. pl.) 'seeds, harvest', OHG *boum* 'tree' (Ger. *Baum*), OE *bēam* 'tree', Goth. *bagms* 'tree'. In contrast, ***Hwes-** (Goth. *wisan* 'be, stay', OHG *wesan*, Arm. *goy* 'is, exists', etc.) combines with animates, both human and animal, to mean 'be', 'stay, remain', 'spend the night': Hitt. *huiš-*, *hueš-* 'live, exist' (of person or animal), *huišu-* 'living', 'raw (of meat)', *huišwant-* 'living',³ Skt. *vāsati* 'is located, remains, spends the night', *vasatī-* 'bird's nest; residence, lodging', Goth. *wists* 'being, creature'.

The generic term for the plant class may have been a derivative of ***bhel-/bhlōH-/bhlH-**, reflected in the earliest dialects as Lat. *flōs* 'flower', *Flōra* 'Flora, plant deity', Osc. *Fluusaī* 'Florae', OIr. *bláth* 'flower', Goth. *blōma* id., OHG *bluomo* (Ger. *Blume*) id., OE *blēd* 'sprout', 'twig', 'flower', 'fruit'; Toch. A *pālt* 'leaf', Gk. *phúllon* 'leaf', Lat. *folium* id., OIr. *bile* 'tree'.

In summary, in Indo-European the class of living things ***k'oĩ-wo-** [+living] subdivides into the animal ***dheu-s-/anH-** [+animate] and plant ***bhel-** [-animate] classes as follows:

3. Interestingly, in the Hittite tradition the entire class of animate beings (e.g. fish, horse, person, ...) is defined as *human huišwan* (KUB VII 33 I 7) 'every living (thing)' (animate).



1.2. The animate class

1.2.1. The opposition of wild to non-wild

In the earliest Indo-European tradition the animate category of living things was divided into two large subclasses, with the class of wild animals, generically labeled **ǵhwer-*, opposed to the class comprising people (**wīr-*), manlike beings (deities), and domestic animals (**phēk̑hu-*). In distinctive-feature terms the class of wild animals is [+wild], that of people and domestic animals [-wild]. This binary opposition is exhibited by all archaic Indo-European systems:

PIE **ǵhwer-*: Gk. *thēr* 'wild animal', Lat. *ferus* 'wild, not domesticated, not tamed' (*non cultus, non domitus*: Dumézil 1966:408); OCS *zvěřī* 'thērion', 'wild beast', ORuss. *zvěř* 'beast, wild animal' (in opposition to people and domesticated animals: *ne tokmo čelověcy, no i skoti i vsja zvěři* 'not only people, but also cattle and all wild animals', *Slovo Daniila Zatočnika*), OPruss. *swīrins* (acc. sg.) 'thēras', 'wild animals', Lith. *žvėris* 'beast'. The Roman goddess Feronia was worshipped in wild places far from the city (Dumézil 1966:403), places where wild animals were naturally to be found.

To refer to wild animals as opposed to domestic animals and people, Hittite uses the descriptive expression *gimraš huitar* 'steppe animals', an exact semantic correspondent to PIE **ǵhwer-* and its reflexes mentioned above. Hitt. *gimraš huitar* is opposed, like Slavic *zvěřī*, Lat. *ferus*, etc., to the set of domesticated animals plus people, as is shown by the following passage in the Hittite hymn 'To the Sun God rising from the sea': ŠA DUMU.LÚ.ULÙLU.TI UR.ZÍR-maš ŠAH-aš *gi-im-ra-aš-ša hu-it-na-aš DI.NAM UD-ti-li zi-ik DUTU-uš ha-an-ne-iš-ki-ši* 'You, Sun God, daily make judgment over the son of humans, the dog, the pig, and steppe animals' (KUB VI 45 III 15-17). Hittite retains the Indo-European semanteme 'wild animal (as opposed to people and domestic animals)', but replaces the original form **ǵhwer-* with the descriptive phrase *gimraš huitar* 'steppe animal'. The replacement is evidently due to Sumero-Akkadian influence: Akkad. *būl šēri* 'steppe animals' is translated with [*gi-im*]-ra-aš *hu-u-i-tar* (KUB VIII 62 I 2) in the Hittite translation of the Gilgamesh epic, which may have sanctioned its further use in Hittite and prepared the way for the replacement of the inherited term. It is significant that

Hitt. *huitar* (gen. *huitnaš*) 'animal' (in a collective sense) itself ultimately goes back to PIE **Hwes-* 'be' (of animates): cf. Luw. *huit-wal-aḫi* 'life', Hitt. *huiš-wa-tar* (Laroche 1959a:47).

1.2.2. People and domestic animals as comprising the non-wild class

The remaining subtype of animate beings is characterized by the shared semantic feature [-wild], which covers both people (**w̥r-*)⁴ and domesticated animals (**phek̥hu-*).⁵ That people and domestic animals form a single class is clearly observable in the oldest Indo-European written documents. The Indo-Iranian and Italic evidence is particularly significant here. Indo-Iranian preserves compounds which juxtapose people and domesticated animals: Ved. *virapśá-* 'abundance of people and animals' (from **w̥r-o-phēk̥h-w-o-*), comparable to the Iranian personal name *Wrpš* < **Vira-fsa-* (Mayrhofer 1973:224). The phrase reflected by these compounds is represented in Av. *pasəuš vīrāat-čā* and Umbr. *u(e)iro pequo* (see Wackernagel 1953:I.280ff., Watkins 1975g:495-96).

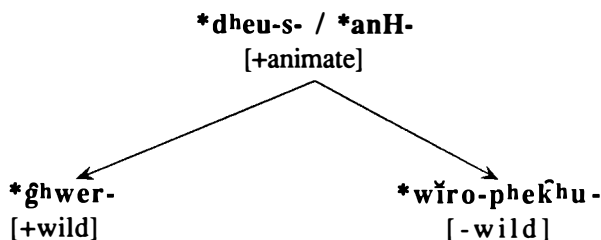
Particularly significant is the sequence of sacrificial animals in which we find people listed together with domestic animals: in Sanskrit Brahman texts we find *human, horse, bull, ram, goat* and in Roman ritual *human, horse, bull* (Dumézil 1966:453). In comparable enumerations from Hittite ritual and mythic texts, 'human' is followed by 'dog' (Ivanov 1974:109), e.g. the sequence *human, dog, pig*, mentioned above; the relations permitted between people and certain domestic animals, described in 1.3.2 below, further testify to the classificatory

4. Skt. *vīrā-*, Avest. *vīra-* 'husband', Lith. *výras* 'man, husband', Lat. *uir* 'man, husband', OIr. *fer* 'man', Goth. *waír* 'man', Toch. A *wir* 'young, hero'; the possible original meaning of the root is found in Lat. *uīs* 'strength', Skt. *vāyas-* 'life force', *deva-vī-* 'pleasing to the gods', etc.

5. Skt. *pásu-* 'cattle', Avest. *pasu-*, Lat. *pecū* 'cattle', Goth. *faihu* 'possessions', OHG *fihu* 'cattle' (Ger. *Vieh*), Lith. *pēkus* 'cattle'. The original collective sense of Indo-European **phek̥hu-*, which included all domestic animals (and not only cattle, as in several daughter dialects) is clear in Vedic: *ásviam paśūn utá gávyaṁ śatāvayam* 'domestic animals: horses, bulls and cows, and hundreds of sheep' (RV V, 61, 5); *áśvāvantam gómantam ā paśūn* 'domestic animals: horses and bulls' (RV I, 83, 4, cf. Watkins 1975g:500); analogous examples are given in Grassmann 1873:795. Forms with zero grade appear in compounds: Skt. *-kṣu-* from **pśu-*, Avest. *fšū-*. In Hittite the meaning 'cattle' is expressed by *šuppala-*, which goes back to the same Indo-European form **phek̥hu-/p̥hēk̥hu-* in zero grade suffixed with *-l-* (for the *-l-* derivation cf. Lat. *pecūl-ium* 'property, possessions'; see Benveniste 1969:I.54-55 for the formal analysis of this archaic form; Alb. *pilë* 'flax comb', Pokorny 1959:797, OE *fihl* 'fabric, scrap of cloth', *ibid.*): **p̥hēk̥hu-(o)lo-*. Palatovelar **k̥h* before *-u-* regularly yields *š* in Anatolian (see I.2.3.2 above), hence Watkins's proposed reflex of **phek̥hu-* in Hittite in the form **pekuš* (Watkins 1975g:509) is improbable; cf. also the etymology of Hitt. *šuppala-* as related to Lat. *suppus*, describing the gait of an animal, in Watkins 1973. The regular result might well have been **pśu(a)la-*, in which the elimination of the cluster **pś-* by metathesis of the initial consonant could have yielded the attested form *šuppala-* (cf. the change of the cluster **pś-* to *kṣ-* in Skt. **pśu-* > *-kṣu-*).

unity of people and domestic animals. In Celtic sagas we find the sequence *warriors, women, dogs, servants* in the Saga of the Expulsion of the Sons of Usnech (see Ivanov 1964:457). In all such enumerations,⁶ people and particular domestic animals constitute a unified group which functions alike or undergoes the same action.

In summary, the class of animate beings is subdivided into wild animals or beasts, on the one hand, and people plus domestic animals, on the other:



1.2.3. The human/animal opposition. The feature speaking/non-speaking

Within the group comprising humans and animals (*wīro-phekhu-), the opposition of the human to the animal world in the ancient Indo-European tradition is based on the gift of speech and the opposition of biped to quadruped. These two features coincide, and the various historical Indo-European traditions continue one or the other of them. They may be symbolized as semantic features of speaking/non-speaking and biped/quadruped.

In Hittite, the speaking/non-speaking feature plays a special role in the human-animal opposition. The opposition can be discerned in ritual texts, especially in the Middle Hittite hymn to the sun (this hymn partly coincides with that discussed in 1.2.1 above):

*nu UR.ZÍR ŠAH-aš-ša ha-an-ni-eš-šar ha-an-na-at-ta-ri šu-up-pa-la-an-na
 ha-an-ni-eš-šar iš-ši-it ku-i-e-eš Ú.UL me-mi-iš-kán-zi a-pa-a-at-ta
 ha-an-ni-at-ta-ri i-da-la-u-wa-aš-ša hu-ú-wa-ap-pa-i-ša an-tu-uḫ-ša-aš
 ha-an-ni-eš-šar zi-ik-pát ha-an-na-at-ta-ri*

6. Cf. e.g. the sequence of ritual animals in East Slavic traditions: the Belorussian ceremony for dedicating a new house stipulates animals staying overnight in the house in the order 'chicken, goose' or 'cat, piglet, sheep, cow, horse, person' (Zelenin 1927:288). Here the order is reversed, running from the least important animals in order of increasing significance and ending with humans. In terms of hierarchical ordering this is the same as the reverse enumeration of animals in order of decreasing ritual significance, as in the Hittite, Sanskrit, and Italic texts mentioned above.

'and you judge over the dog and pig; and the judgment over domestic animals⁷ who do not speak with their mouth, that [judgment] you judge; and you judge the bad man' (KUB XXXI 127 I 42-46)

About *šuppala*- 'domestic animals' it is specially remarked that they 'do not speak with their mouth'. Here we have a clear characterization of this class of beings by the fact that they do not have speech.⁸

An analogous classification based on speech vs. lack of speech is further attested in the Latin tradition, which indicates the great age of this classification, reconstructible for Proto-Indo-European. E.g. in Varro:

instrumenti genus vocale et semivocale et mutum, vocale in quo sunt servi, semivocale in quo sunt boves, mutum in quo sunt plaustra
(*De re rustica*, I:17.1)

'tools are of three types: speaking, half-speaking, and mute; the speaking ones include slaves, the half-speaking include oxen, and the mute include vehicles'⁹

The tripartite division of 'tools' in the Roman tradition is a semantically transformed ancient Indo-European classification of the world of man and domestic animals, built on the binary opposition of speaking to non-speaking. In the Roman classification the non-living tools are classified as 'non-speaking', the living ones as 'speaking', with cattle being a transitional category between the speaking and non-speaking classes. This overlapping of features and the rise of the three-way opposition are evidently due to the appearance of a new classificatory group, that of 'tools', still subdivided by the ancient Indo-European principle of speech: Lat. *meminī* 'I remember', Goth. *munan* 'think, recall', OCS *mъnѣti* 'think', Skt. *mānas-* 'mind, spirit, reason', Gk. *ménos*, Lat. *mēns* 'mind, thought'. To designate the class of speaking beings or (what is the same) rational beings, the ancient Indo-European tradition could employ a term formed from **men-* (cf. Hitt. *kueš UL memiškanzi* 'those who do not speak') or one formed from **we/okho-* with the meaning of 'speech', 'speaking'¹⁰ (cf.

7. The 'domestic animals' denoted by the Hittite term *šuppala*- primarily include cattle and evidently (to judge from this text) exclude dogs and pigs.

8. A typological parallel to the man-cattle opposition based on speech can be found in the Georgian classification of cattle as *p'ir-ut'q'v-i*, lit. 'mouth-not-speaking'.

9. Compare this interpretation with that of Vygotskij 1960:117: "Even the Romans, who distinguished slaves, domestic animals, and tools only on the basis of speech, established not two but three degrees of capacity for speech: *instrumentum mutum* 'mute or inanimate tool', *instrumentum semivocale* 'tool having half-speech' (i.e. domestic animal), and *instrumentum vocale* 'tool having speech' (i.e. slave)."

10. Skt. *vak-/uk-* 'speak', *vāk* 'word', Lat. *uōx* 'voice', Toch. A *wak* 'voice', Gk. *épos* 'word, speech', OHG *gi-wah-anen* 'remember, think about, mention, quote'.

Lat. *uocalis* 'speaking', *semiocalis* 'half-speaking', etc.).¹¹

Speech, which humans have and animals do not, and the ability to think, cogitate, and experience (which was identified with speech), lead naturally in the separate Indo-European traditions to the rise of a category of personified 'reason' or 'soul' which has the capacity for speech. In the Old Hittite tradition we find the term *ištanžana-*, correlated with a mental category of reason or soul which is found in speaking beings like man and gods (Kammenhuber 1965). This is a distinctive equivalent to later Greek *psukhē* 'soul', which was capable of speaking with the person (or deity) it inhabited and of being reflected in human eyes¹² (Lang 1973).

The semantic distinctive feature of speaking/non-speaking, which is the basis for the human/animal opposition, implies that the same two groups are opposed in the feature rational/non-rational, since in the ancient Indo-European tradition the capacity for speech is identified with rationality. This conclusion follows from the etymological identity in various Indo-European dialects of the word for 'speak' and words meaning 'think', 'remember': Hitt. *mem(m)a-* 'speak', *memiya-* 'word', 'deed', 'mood', 'state of mind', Luw. *mammanna-* 'speak' (a reduplication of the root **men-*), ORuss. *měniti* 'speak', Lith. *mĩnti* 'call, name, guess', Latv. *minēt* 'recall', 'name, call', etymologically related to Skt. *mānyate* 'thinks', Gk. *mimnēskō* 'recall, remember; turn thoughts to', *mémōna* 'have incentive, desire'.

1.2.4. The two-legged/four-legged (biped/quadruped) opposition

Together with the speaking/non-speaking feature, the opposition of human to domestic animal is realized with the help of the more concrete semantic feature

11. The negative designation of the 'non-speaking' class in the Hittite formula allows us to attribute the same structure to other ancient Indo-European dialects. In the Vedic meaning of the participle *uk-tá-* 'word, speech' (Grassmann 1873:1194), in the Sanskrit compound *an-uktá-*, preserved in the specialized meaning 'song-less', we can see the trace of an older meaning 'wordless, unsaid' (cf. OIr. *anocht* 'mistake in speech', Watkins 1970). The Balto-Slavic term for 'mute, dumb' (> 'deaf') may also belong here: **nēm-*, OCS *němŭ* 'dumb', Russ. *nemoj*, ORuss. *něn'c* 'foreigner' (Vasmer 1953:II.211-12 [1964-1973:III.62]), Latv. *mēms* 'deaf' (cf. *mēmie gari*, lit. 'deaf souls' as a term for cattle; *mēma*, in a ritual context, a term for a ceremony performed in silence: Mühlenbach and Endzelin 1923-1932: II.615-16). Balto-Slavic **nēm-* presumably goes back to IE **nē-mn-* 'not speaking', with long grade in the privative prefix (cf. OCS *ně-kŭto* 'someone', *někyjŭ* 'a certain, some', cognate to Lith. *nėkas* 'something') and zero grade of the root **men-* 'speak'. Regular simplification of the cluster **mn-* yields the reconstructed Balto-Slavic **nē-m-*.

12. In one of the Hittite rituals connected with burial rites, the deities *Dšakuwaššaš* 'god of Eyes', *Dḥantaššaš* 'god of Forehead', *Dištamanaššaš* 'god of Ears' are invoked along with *Dištanžaššaš* 'god of Mind' (KUB XX 24 17, 22, 27, 31). This is obviously a deification of the forehead as the location of reason, and eyes and ears as the means of connection with the outside world. For the possible etymology of Hitt. *ištanžana-* cf. also Ger. *Verstand*, Engl. *understand*, OE *under-standan* 'know', Gk. *epistamai* 'understand, know how'.

of biped/quadruped, based on the external form of the opposed referents. This opposition can be established from Sanskrit, Greek, Italic, and Hittite evidence. In Sanskrit and Italic we find etymologically identical terms for 'two-legged' (i.e. people) and 'four-legged' (i.e. domesticated animals): Skt. *dvi-pád-*, *cátuṣ-pad-* (over 20 occurrences in the Rigveda: Grassmann 1873:434, 652), Umbrian *du-pursus*, *petur-pursus* (Iguvine tables VI B 11), both literally 'two-foot', 'four-foot'. The Hittite translation of the Hurrian tale 'The Sun God, the cow, and the fisherman' tells of the love of the Sun God, who takes the form of a young man, for a cow, who becomes pregnant by him and bears 'a son with two legs' while she herself has 'four legs' (cf. Friedrich 1949).

The terms 'two-legged' and 'four-legged' as well as their opposition go back to Common Indo-European times and are reflected in many historical Indo-European dialects. In addition to the Sanskrit and Italic examples just mentioned, these terms are attested in Gk. *dípous*, Lat. *bipēs*, OE *twifēte* 'two-footed'; Myc. *qe-te-ro-po-pi* (**kweteropopphi*, Lejeune 1958:36), Gk. *tetrápous*, Lat. *quadrupēs* 'four-footed', and others.

In the Greek tradition the opposition of two-legged to four-legged is manifest in the ancient mythological motif of the famous riddle of the Sphinx given to king Oedipus:

ἔστι δίπουν ἐπὶ γῆς καὶ τετράπον, οὗ μία φωνή...

'There exists a two-legged one on the earth and a four-legged one which has one voice'

Presumably the entire form of the riddle, with its opposition of two-legged human and four-legged animal (a metaphor for a baby in this riddle, a pregnant woman in the earlier Hittite variant), reproduces the structure of the Indo-European opposition (cf. Porzig 1968).

In a number of Indo-European traditions we find special legal contexts where the two-legged/four-legged opposition is suspended to some extent. An especially clear example is Gk. *andrápodon* (lit. 'human-legged') as applied to captive soldiers, who were used as beasts of burden. In addition to Roman and Sanskrit parallels which point to the Common Indo-European character of this custom (cf. Scharfe 1978), there is a conclusive parallel in the ancient Hittite custom of harnessing people prosecuted for crimes in place of oxen (in the Old Hittite book of anecdotes from the chronicle of the royal court).

1.2.5. The classification of rational beings based on the features mortal/immortal and earthly/heavenly

The semantic feature of two-legged/four-legged, which coincides with ratio-

nal/non-rational, divides the set of non-wild beings into two large classes: rational two-legged and non-rational four-legged. The rational class contains a well-defined subset to which the two-legged/four-legged opposition is irrelevant; put differently, that opposition distinguishes a subset of rational beings which contrasts with people in being uncharacterized for the two-legged/four-legged feature. This is the class of gods, **t'yeu-* (Hitt. *šiu-* 'god', Skt. *deváh*, Lith. *diēvas*, Lat. *deus*, OIr. *dia* 'god', OIcel. *tívar* 'gods', etc.; cf. Watkins 1974), which are opposed to humans, **manu-* (Skt. *mānu[ṣ]* 'person', 'ancestor', Goth. *manna* 'person', OIcel. *mannr*, OE, OHG *mann* 'man; person', Russ. *muž* 'husband', Watkins 1971:1500). The basic semantic features differentiating humans from gods are earthly/heavenly (Benveniste 1969:II.180) and mortal/immortal. The entire class of people in Indo-European dialects is characterized by the epithets 'mortal' and 'earthly' in opposition to the immortal and heavenly gods.

'Mortal' = 'human': Skt. *márta-* 'person', *mártya-* 'mortal', Avest. *maša-* 'person', *marəta-* 'mortal', OPers. *martiya-*, Gk. *mortós* (Hesychius), Arm. *mard* 'person' (from **mer-* 'die', 'disappear': Skt. *mriyáte* 'dies', Arm. *meranim* 'I die', Lat. *moriōr* id., OCS *mrěti* 'die', cf. Hitt. *me-ir-ta* 'disappeared'). In another group of ancient Indo-European dialects we find forms of **dheu-* 'disappear, die': Goth. *diwans* 'mortal' (cf. OSax. *dōian* 'die', Goth. *daups* 'dead', *daupus* 'death', OHG *tōt*, OE *dēad* 'dead'; cf. also Lat. *fūnus* 'burial', Arm. *di* 'corpse'; with reduplication: OIr. *ded-*, pres. *ru-deda*, pret. *con-ro-deda* 'disappear', cf. Marstrander 1924:15), OIr. *duine* 'person' ('mortal'), cf. Meid 1976; OHitt. *danduki-* 'mortal; person' (with prenasalization of the root consonant).

'Earthly' = 'human': Lat. *homō* 'person', Osc. *humuns* 'people', Goth. *guma* 'person', Lith. *žmuō* 'person', OPruss. *smoy* 'person', *smūni* 'personality', all from **dh(e)ǵhom-* 'earth': Hitt. *tekan* 'earth', Toch. A *tkam*, Gk. *khthōn*, Skt. *kṣam-*, etc.

Both **m(o)r-tho-* and **dhǵhom-*, which are in complementary distribution by dialect, express the distinctive feature value 'mortal' which characterizes humans, **manu-*. In Hittite one of the inherited words was evidently replaced with *ak-* 'die', which characterizes the class of humans by the same semantic feature.

'Immortal' = 'god': Skt. *amṛta-*, Avest. *aməša-*, Gk. *ámbrōtos* 'immortal' (as epithet for gods, Thieme 1952, 1968b); PIE **ǵm-r̥tho-*.

'Heavenly' = 'god': Hitt. *šiu-* 'god', Luw. *Tiwa-* 'Sun god', Skt. *devá-* 'god', Lat. *deus* id., OIr. *dia*, Gk. *Zeús* (god of clear sky), all from **t'yeu-/*t'iw-*. The original meaning of this root was 'sky', cf. Skt. *divyá-* 'of the sky, heavenly', Lat. *dīus* id., Lith. *diēvo sūnėliai* 'sons of the sky, sons of heaven'.

Since **t'yeu-/*t'iw-* 'sky' is used as a word for 'god' in all the oldest Indo-European dialects, the semantic feature of earth/sky is obviously the one

distinguishing the notions 'human' and 'god'. The mortal/immortal opposition is apparently a later superimposition. These two features make up a single semantic notion of deity vs. non-deity, of which mortal/immortal and earthly/heavenly are dialectal variants.

1.2.6. *Language of gods vs. language of humans*

Another feature opposing gods to people in the ancient Indo-European tradition is the special 'language of gods', which is distinct from 'language of humans'. The nature of this opposition in the Hittite, Greek, Celtic, and Germanic traditions allows us to regard it as very ancient, going back to Indo-European times (see Güntert 1921, Watkins 1970).¹³ Gods are distinguished from people not only in being heavenly or immortal, but also in having a special language and special food distinct from those of people. In Sanskrit the food of gods is *Amṛta-*, which is itself deified. In the Greek tradition it is *ambrósia* 'food of gods' and *néktar* 'drink of gods'; both words are based on the idea of overcoming or denying death: the first contains **mer-* 'die' (see above), the second **Hneḱh-* 'die; disappear physically', Skt. *naśyati* 'disappears; gets lost', Avest. *nasu-* 'corpse', Gk. *nékus*, Lat. *nex* 'death; murder', cf. Thieme 1968a.

Both of these characteristics of gods — their special speech and their special food — are united into a single theme in the myth about obtaining the 'honey of verse' in the Younger Edda (Poetic Diction) and in the Elder Edda (The Sayings of the High One, 104-10), for which an analogy can be found in Sanskrit mythology (Dumézil 1966:190; cf. also Dumézil 1924, 1925 for this cycle of Indo-European myths).

1.2.7. *The free/non-free opposition among people*

The category of earthly people, or mortals, is in turn divided into two basic subclasses, the free and the non-free. The Proto-Indo-European character of this division is revealed by comparative analysis of the relevant terms in various ancient Indo-European branches. A comparison of Hitt. *arawa-* 'free', 'freed of duties, obligations', Lyc. *arawa* 'free (from taxes)' (Laroche 1974:123) with Lith. *arvas* 'free' establishes the great antiquity of this term for free people. If the base is related to PIE **arw-* (Lat. *aruum* 'field', Mlr. *arbor* 'grains,

13. Cf. the typical formulas opposing the 'language of people' to the 'language of gods' in various Indo-European traditions: Hitt. *dandukešni...*, DINGIRMESŠ-*naš-a ištarra* '(is called) ... among the people, but ... among the gods' (Friedrich 1954); Gk. *...kiklěskousi theof, ándres de...* 'the gods call it ..., but the people ...'; Olcel. *heitiir með monnum, enn með ásom...* 'is called ... among people, but among the gods ...' (Güntert 1921).

cereals', Gk. *ároura* 'arable land', Arn. *haravunk'* id.), then the word must originally have designated free farmers.

Another ancient term for free people, from another dialect group, is the base **leudhero-*, attested in Gk. *eleútheros*, Lat. *liber* 'free', OCS *ljudiže* 'people', ORuss. *ljudin* 'free person', Latv. *ļaudis* '(one's own) people', Lith. *liáudis* 'folk, people', OHG *liut* id. (Ger. *Leute*). This base is ultimately connected to the meaning 'growth', 'sprouting (of plants)'; the primary meaning is reflected in Goth. *liudan* 'grow', Skt. *rodh-* 'grow, develop', and also in Lat. *liberī* 'children' (i.e. 'those who are growing', Benveniste 1969:I.322-23, Szemerényi 1977b:116). It is significant that the Roman festival *Liberalia* (dedicated to the deities Liber and Libera) had a strongly agricultural character (Dumézil 1966:216, 370-71).

Thus the two formally distinct words referring to free people in the various Indo-European traditions are associated with similar sets of meanings, meanings which have to do with the economic activity of free people: farming.

1.2.8. The correlation of non-free people and domestic animals

Such a class of free people, evidently connected with economic activity and primarily with agriculture, must be posited for the Proto-Indo-European era, and hence the entire set of people in the Indo-European tradition must be regarded as consisting of two basic categories, the free and the non-free. The non-free class evidently had no Proto-Indo-European designation, which may be why it was terminologically lumped with domestic animals when **phekhu-* was used in a broad sense; examples from Sanskrit are, in the Atharvaveda: *yá īśé paśupátīḥ paśunām cátuṣpadām utá yó dvipadām* 'the lord of **phekhu-*, who rules over the **phekhu-*, four-legged and two-legged' (AV II, 34, 1, cf. Watkins 1975g:496); in the Rigveda: *dvipáde cátuṣpade ca paśáve* 'two-legged and four-legged **phekhu-*' (RV 296, 14; for the interpretation see Grassmann 1873:795).

There is another, analogous generic term combining non-free people and domestic animals and thereby revealing the absence of a special term for non-free people in ancient Indo-European: Hittite texts use *šaru*, lit. 'booty, plunder' (cf. Mlr. *serb* 'theft', Welsh *herw* 'raid, outlawry', Watkins 1975b), in a sense referring to NAM.RA 'prisoners' (to be resettled) together with GUD 'cattle' and UDU 'sheep and goats' (while other kinds of plunder are designated by *aššu* 'property', from PIE **wos-u* 'good': Hitt. *aššu-*, Luw. *wašu-*, Gk. *eús*, Skt. *vasu-*, *su-*, see Puhvel 1980): *maḥḥan-ma EGIR-pa uwanun nu šaru kuit* NAM.RA GUD UDU AKŠUD 'but when I returned, the booty in deportees, cattle, and sheep which I found...' (KBo V 8 III 37ff.). Another example is *nu-mu-kan šaru kuit* NAM.RA GUD UDU *mekki makkeššan ešta* 'and because the booty in deportees, cattle, (and) sheep had gotten much too great for me...'

(KBo V 8 IV 13-14, see Watkins 1975g:492).

The picture of social structure thus reconstructed for Proto-Indo-European on the basis of linguistic facts agrees typologically with the salient feature of the ancient Near Eastern household, which consisted of proprietors (or rulers), servants, and domestic animals (Gelb 1972:90, Diakonoff 1973).

1.2.9. Dialect terms for non-free people

People not belonging to the free category were given special designations in the individual Indo-European traditions; these terms do not go back to a common protoform. In Hittite the term for this category of people is *arnuwala-* (lit. 'those to be taken away', from *arnu-* 'bring back, lead away', cf. Skt. *ṛṇóti* 'puts into motion, sends', Gk. *órnumi* 'wake up, make move'; the Hittite word is an archaic formation with modal *-l-* suffix); usually the term is rendered with the Sumerogram NAM.RA,¹⁴ see Alp 1950, Gelb 1973:79, 92, 93, 94, Diakonoff 1967, Giorgadze 1973. In the Italic tradition the term *seruus* arises, later acquiring the meaning 'slave'; it is derived from a base originally meaning 'serve, guard': Lat. *seruō* 'guard, watch', Umbr. *seritu* '*servato*', Osc. *serevkiđ* '*auspicio*', Avest. *haurva-* 'guarding' in *pasuš-haurvō* '(dog) guarding cattle'.¹⁵

In the Slavic tradition a word for the second class of people, **rabŭ* 'servant, slave, worker' (OCS *rabŭ*; cf. Arm. *arbaneak* 'servant, helper'), arises from the original **orbho-* 'deprived (of one's share), indigent', later 'orphan': Gk. *orphanós* 'orphan', Arm. *orb* 'orphan', Lat. *orbus* 'deprived, orphaned'. A further development is the meaning 'worker in service': Goth. *arbaiþs* 'need, work, labor', OHG *arabeit* 'work' (Ger. *Arbeit*), OCS *rabota* '*douleía*', 'bondage, forced labor', ORuss. *robota* 'work, slavery, bondage'. The development from 'orphan, deprived' to 'in service, captive' is explained by the lack of rights of orphans taken into other homes as servants (Porzig 1954:121 [1964:182]). In addition, at a fairly early stage in the development of social differentiation, a stage like that of Homeric Greece (Lencman 1963) or the ancient Germans, orphans without civil rights were also created by the practice of killing male prisoners of war, leaving only women and children as workers (Gelb 1972:85, 1973:72ff.).

A typologically later way of incorporating captives from conquered lands

14. In addition to NAM.RA this second category also included *İR* 'slaves' and GEME 'female slaves' (Giorgadze 1973, 1976, Diakonoff 1973), and possibly other kinds of people not belonging to the *arawa-* 'free' class. The Hittite readings of these Sumerograms are not known, so no etymology can be given. The Luwian reading of the ideogram *İR* is *ḫutarli-* (Laroche 1959a:49), a form of unknown etymology.

15. Also cognate are OCS *xraniti* 'keep' and Gk. *hērōs* 'defender, hero' (Pokorny 1959:910). Given the Greek meaning, Hitt. *šaru* 'plunder', OIr. *serb* 'theft', Welsh *herw* 'raid, outlawry' may also be cognate, see Vendryès 1935.

into the social structure is attested in the Hittite tradition, where part of the captives (*arnuwala-*) were resettled as bonded subjects. Only in classical (post-Mycenean, post-Homeric) Greece and Rome does a new form of dependency arise with all captive males incorporated into the social structure as slaves (Gelb 1972, 1973, Lencman 1963).¹⁶

'Slave' as a social term including part of the second category of people could also have arisen as a term for the subjugated indigenous population. This is the origin of the Sanskrit term *dāsá-*, which in the Rígvēda preserves, together with the meaning 'slave, servant', the older meanings 'demon', 'barbarian belonging to another tribe', 'alien' (Grassmann 1873:598). The word is ultimately linked to the term for a subjugated foreign country, as shown by Skt. *dásyu-* 'infidels', 'nonbelieving peoples and tribes' beside the cognate Iranian *dahyu-* 'country': OPers. *dahyu-* 'country as a territory of the Achaemenid empire' (see Benveniste 1969:I.318).¹⁷

1.2.10. Projected relations of free to non-free in the world of gods. Humans as non-free in relation to gods

The terms discussed here could have reflected not only hierarchical relations within the class of people, but also those between people and gods, with the free/non-free relationship projected onto the god/human relationship. A striking example is a passage from the 'Prayer during a time of plague' of Mursilis II (KUB XIV 8+10+11, §10 1ff.), where the prayer (*arkuwar*) to his 'master' the Thundergod, asking him to hear (*ištamaš-*) and save (*huišnu-* 'bring to life, let live') him, is compared to the appeal of a slave to his master: *ma-a-an A.NA İRDİ ku-e-da-ni-ik-ki ku-it-ki na-ak-ki-ya-aḥ-ḥa-an nu-za A.NA EN.ŠU ar-ku-wa-ar i-ya-az-zi na-an EN.ŠU iš-ta-ma-aš-zi* 'if a slave is oppressed, then he appeals to his master, and his master will hear him...'.¹⁸ The Hittite reading of the Sumerogram EN 'master (of a slave)' was *ešḥaš*,

16. Mycenaean Greek has *do-e-ro* for 'slave' (Gelb 1972, Poljakova 1968, Tovar 1973:21-43); this is Classical Gk. *doúlos* (Hom. *doúlion ēmar*, lit. 'day of slavery'), a word of unclear etymology. Its source has been attributed to Asia Minor (see Benveniste 1969:I.359). This word bears an interesting resemblance to a form from Asia Minor, 'Istanuvian' Luwian *ḫutarla-* (KUB XXXV 136 Rs. IV 16) (beside *ḫutarli-*, mentioned above).

17. Analogous formations include OE *wealh* 'slave', originally 'Celt', 'conquered people'; medieval Lat. *sclavus* from a term like *Sclaveni* 'Slavs'; MGk. *Sklabēnot* > *Skláboi* (see Vasmer 1953:II.656-57 [1964-1973:III.666]).

18. Commenting on this text, Goetze (1929:161, 163) writes: "People are slaves, the gods are their masters... Relations in the heavenly world of the gods are an exact reflection of earthly ones. The gods are greatly exaggerated people; the human master served as prototype of the gods." It is worth noting that gods and people share several common traits, including social organization, the feature that unites them into a single class of rational living beings. It is interesting that in the Rígvēda the dual of the word *vidátha-* 'meeting' designates the two assemblies of gods and people (Hitt. *tuliya-* 'meeting' is used in both senses).

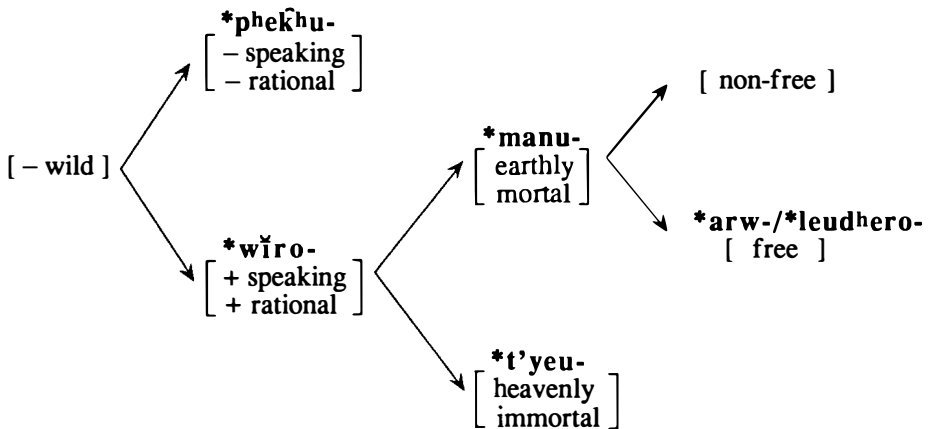
related to Lat. *erus* 'lord, master of a slave' (e.g. in Plautus).

The terms discussed so far do not exhaust the words pertaining to the free and non-free categories of humans. Individual Indo-European traditions could have produced other terms for the hierarchical social relations, even at the earliest stages. One such extremely archaic term may have been the compound of preverb **upho-* and verb **sthā-*, reflected in Skt. *úpa-sti-* 'subordinate, servant' (which occurs twice in the Rigveda); cf. Skt. *upasthānam* 'service', which can be identified with Mlr. *foss* 'servant', Welsh, Bret. *gwas*, Cornish *guas* (the source of medieval Latin *vassus*, *vassallus* 'vassal').

1.2.11. The classification of animate, non-wild beings

The class of animate, non-wild beings which was described earlier divides into two groups: rational, speaking beings (in the broad sense, including gods) **wīro-* [+speaking, +rational] and domestic animals **phek̑hu-* [-speaking, -rational]. The correlation of two-legged vs. four-legged was superimposed on the category **wīro-* to divide it into two subclasses, people **manu-* and gods **t'yēu-*, with the feature values [earthly, mortal] and [heavenly, immortal] respectively. The relationship between these two subclasses can be identified to a certain extent with that between the two subclasses of **manu-*: the non-free and the free **arw-/*leudhero-*. These relationships are shown in Figure 1.

Figure 1
Feature hierarchy for non-wild animate beings



1.3. Hierarchical relationships within the class of domestic animals

1.3.1. Groups of domestic animals

The class of domestic animals is distinguished within the category of non-wild animate beings by the feature [±speaking]. The feature value [four-legged] separates out of it a class of animals including horses, donkeys, cattle, sheep and goats, dogs, pigs, and cats; this class is opposed to that of domestic fowl and bees, which played an important role in the economic and spiritual life of the ancient Indo-European tribes.¹⁹

1.3.2. Horses as animals especially close to people. The preeminent position of horses among domestic animals

Within the first class of domestic animals, horses (and also donkeys) were distinguished from the horned animals by their ritual closeness to and even identification with people. The ritual closeness of horses to people in Indo-European conceptions is shown not only by the hierarchical succession of animals in the Sanskrit and Roman rituals mentioned above, but also by a number of legal and religious prescriptions attested in ancient Indo-European traditions. For instance, §200A of the Hittite Laws shows the special legal status of horses and mules, in some respects equating them to female slaves captured in military actions (*arnuwala-*, NAM.RA): *ták-ku LÚ-aš ANŠE.KUR.RA-i na-aš-ma ANŠE.GÌR.NUN.NA kat-ta wa-aš-ta-i Ú.UL ḫa-ra-tar LUGAL-uš-aš Ú.UL ti-iz-zi LÚSANGA-ša Ú.UL ki-i-ša ták-ku ar-nu-wa-la-an [ku-iš-ki] kat-ta še-eš-ki-iz-zi an-na-aš-ša-an-n[a?...] Ú.UL ḫa-ra-tar* ‘if a man commits sin with a horse or mule, there shall be no punishment. He shall not appeal to the king. And he must not become a priest. If anyone sleeps with a woman from the captives taken in war or with her mother [...], there shall be no punishment’. But the same sin with a dog or pig was punishable by death (§199): *ták-ku ŠAḪ UR.ZÍR-aš kat-ta ku-iš-ki wa-aš-ta-i a-ki-aš* ‘if anyone commits sin with a pig or dog, then he must be killed’. Dogs and pigs obviously belonged to a separate subclass of domestic animals, distinct from that headed by horses.

Analogous motifs are found in other Indo-European traditions, which allows us to trace their origins to the Proto-Indo-European period. In the Ashvamedha ritual of the Sanskrit tradition, after the sacrifice of the horse the ranking queen was symbolically married to the sacrificed horse, with the verbal commentary of the priests. The queen lay down with the dead horse and was covered with a

19. The Greek tradition even has a special term *tritúa, tritús* ‘triad’ which reflects the ranked classification of sacrificial animals: *kriós* ‘ram’, *taûros* ‘bull’, *kápros* ‘boar’; this correlates with the data of other Indo-European traditions (see Puhvel 1978).

blanket (P. Dumont 1927).²⁰ An analogous rite in the burial ceremony is also reconstructed for the Iranian tradition, where Herodotus and other classical authors testify that among the Scythians one of the leader's concubines was strangled and a horse sacrificed; further evidence is the second Tuekta kurgan in the Altai Mountains, which contained the burial of a woman together with a riding horse (Rudenko 1968:27; cf. Litvinskij 1968:28-35). There is parallel archeological evidence for the Germanic tribes (Beck 1965:57-58), supported by Arabic sources (Ibn Fadlan). A coronation rite comparable to the Ashvamedha is attested in the Celtic tradition, where in ancient Ireland the king performed a rite of symbolic marriage with a sacrificed horse (Schröder 1927).²¹

A certain equivalence of horses and people is further shown in the similar occurrence of 'person' and 'horse' in Sanskrit and Latin compounds denoting rituals: Skt. *aśvamedhá-* 'horse sacrifice', *puruṣamedhá-* 'human sacrifice',²² Lat. *caput equi* 'horse's head', *caput hūmānum* 'human head' (see Dumézil 1966:451-53).

All this evidence shows that horses held the uppermost position among domestic animals, and that domestic animals as a group were viewed in the ancient Indo-European tradition as a hierarchy of relative significance to the economy, war, and transportation. The discussion of lexemes and semantic units in Chapter 3 follows that hierarchical ordering.

1.3.3. The internal classification of domestic animals

Within the category ***phekhu-** we can separate out a four-legged group, which in turn divides into two ritually significant subgroups based on their functional closeness to people: the major domestic animals, headed by the horse and also including sheep and rams, and the lesser domestic animals — dogs, pigs, and cats. The first group further breaks down into the hornless animals, horses and donkeys, and the horned animals, large (bull, cow) and small (sheep and goats).²³ The characteristic feature of the horned group is clearly shown in the

20. In this ritual, in which four wives participated, three of the wives then divided the horse into three parts, of which the back part was called *páśu-* 'livestock'.

21. For a possible cognate to the term *aśvamedhá-* in Gaulish see Puhvel 1955, 1970a.

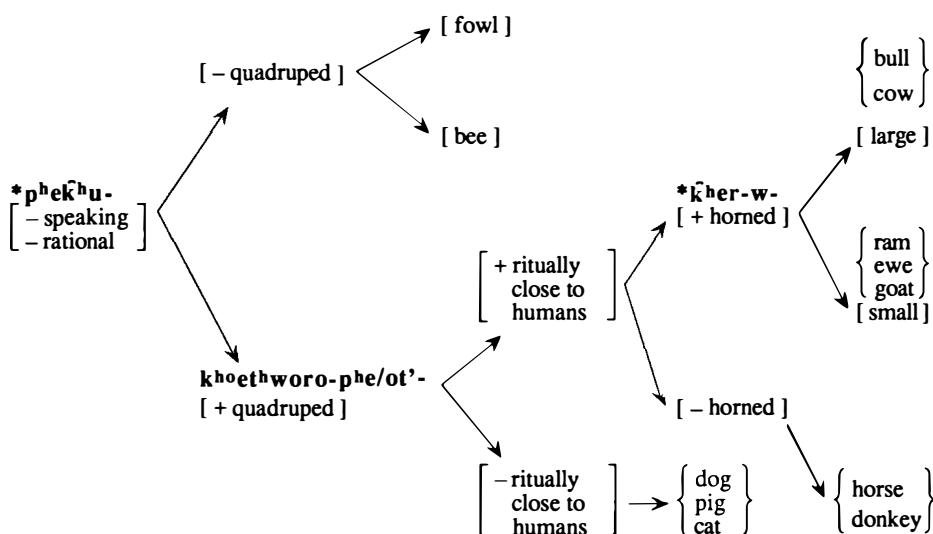
22. The question of whether there was human sacrifice in the Indo-European tradition remains somewhat unclear, since local traditions could have influenced the individual Indo-European traditions, as may have been the case for Sanskrit (see Kirfel 1951, Puhvel 1970a:161-62) and Hittite (for the sacrifice of prisoners of war see Kimmell 1967). However, there is evidence, particularly Germanic, for the Proto-Indo-European nature of human sacrifice: Ward 1970, Sauvé 1970.

23. Historical Indo-European dialects also preserve reflexes of a special Proto-Indo-European term ***t'e/omH-** for the taming or domestication of animals such as horses, cows, and sheep, a term which reflects the process whereby the Indo-European tribes domesticated wild animals: Skt. *damáyati* 'tames, forces', Ved. *damitá* 'one who pacifies, tamer', *dāmya-* 'young

word **k̥her-w/n-* 'horn', attested in all dialects and sometimes having the meaning 'horned animal' or 'cow': Hitt. *karawar* 'horn',²⁴ Hier. Luw. *surna-* 'horn', Skt. *śṛṅga-*, Avest. *srū-* 'horn', *srvara-* 'horned', Gk. *keras* 'horned'; Lith. *kārvė* 'cow', Russ. *korova* 'cow', Alb. *ka* 'bull' beside Lat. *ceruus* 'deer', OWelsh *carw* 'deer'.

The non-four-legged set includes domestic fowl and bees. A schematic tree diagram of the entire classification is shown in Figure 2.

Figure 2
Feature tree for domestic animals



bull to be tamed', Pers. *dām* 'domestic animal', Oss. *domyn* 'tame, wear out' (Abaev 1958:1.365-66, Benveniste 1955); Gk. *dām̃nēmi* 'tame, force', in Homer 'break' (of horses: Iliad 17.76-77, of horses and mules: Odyssey 4.635-37); Dor. *dmātós* 'tamed', Hom. *ádmētos* 'untamed, never bridled' (of cattle, Iliad 10.292-93; of horses and mules), *damdlēs* 'young bull to be tamed', *damālē* 'heifer'. Lat. *domō* 'tame' (e.g. lions), 'break' (e.g. horses), *domitor* 'tamer (of wild animals, *ferārum*), breaker (of horses, *equōrum*)'. OIr. *damnaim* 'tie up, break (horses)', *dam* 'bull', Welsh *dafad*, OCom. *dauat*, Bret. *dañvat* 'sheep'. Goth. *ga-tamjan* 'tame, break, domesticate', Olcel. *temja*, OE *temian* (Engl. *tame*), OHG *zemmen* (Ger. *zähmen*) 'tame, break'. Cf. Alb. *dhēntē* 'sheep; sheep and goats'. Also related to this root is Hitt. *damas-* 'crush, rape' (especially of women); cf. Hom. Gk. *dām̃nēmi* 'marry, rape', *admēs* 'untamed; unmarried girl'. That the word had both meanings 'tame' and 'rape' may point to a symbolic connection between the taming of animals and the cohabitation ritual, as reflected in the Hittite laws discussed above and in Proto-Indo-European sacrifice rituals like the Ashvamedha.

24. This term is used of the horn of the mythic bull who separated the mountains and broke a path to the sea for the Hittites in the Old Hittite text KUB XXXI 4 Vs.+KBo III 41 (Laroche 1971:4, no. 16).

1.4. Wild animals

1.4.1. The subgroups of wild animals

The class of wild animals, **ghwer-*, is a subclass of the animate beings, parallel to the non-wild animate beings; in the earliest Indo-European mythic views it is divided into subgroups of wild animals based on their relations to other cosmological concepts, which reflect the structure of the universe. In ancient cosmology, including that of the Indo-Europeans, the world is represented as a tree or a similarly constructed ritual object pointing upwards. All such world symbols reflect the universal pattern of the Cosmic Tree, which serves as a model of the structure of the universe. The category of living things, which includes both animate and inanimate, is seen as distributed over the various parts of the Cosmic Tree — the center part or trunk, the upper part or branches, and the lower part or roots. In this way the class of living things, and especially that of wild animals, is divided into inhabitants of the middle, upper, and lower worlds.

The model of the universe thus reflected is a cultural universal of sorts, since it is found in the basic mythological traditions of the most diverse cultures throughout a vast expanse of Eurasia and the New World (see Harva 1922-1923, de Vries 1957:II.372ff., Toporov 1964, 1971, 1973).

1.4.2. Animals of the Middle World

In the archaic Indo-European cultural tradition the Middle World, associated with the middle part of the Cosmic Tree, comprises the basic deities (in particular, the anthropomorphic ones, who take part in earthly affairs), people, domestic animals, and four-legged wild animals. The semantic unit 'Middle World' was evidently designated by the word **medh_{yo}-*: Skt. *mādhyā-* (neuter) 'middle; intermediate space (between the sky and the earth)', *madhyamā-* 'middle' (adjective; used of the intermediate space), OIcel. *Miðgarðr* 'Middle World', OE *middan-geard* 'Middle World, Earth' (Common Gmc. **midja-gardaz*); cf. Lith. *mėdžias* 'tree', Latv. *mežs* 'forest, tree', OPruss. *median* 'tree', Russ. dial. *mežá* 'grove, small forest'.²⁵ The semantic development from 'middle' to 'tree, forest' points clearly to the original association of **medh_{yo}-* 'middle' with the center of the tree symbolizing the world. In some Indo-European dialects the same word **medh_{yo}-* forms an epithet for wild animals that were hunted, a semantic transfer that can also be explained as due to an ancient association of these animals with the middle part of the tree. Clear

25. Slavic *meža* generally means 'boundary (esp. between fields)'; this meaning can be derived from that of a boundary marker or column, equivalent in ritual function to a tree.

evidence comes from Baltic: Lith. *medžióti* ‘hunt (wild animals)’, Latv. *meža* ‘wild’ used of any wild animal (*meža zvērs* ‘wild animal’); cf. also Latvian expressions like *meža vīrs* ‘wolf’, lit. ‘forest man’, *meža suns* ‘wolf’, lit. ‘forest dog’ (Mühlenbach and Endzelin 1923-1932:II.611).

The wild animals of the Middle World form a clear-cut group connected with the hunt and ritual and opposed in early Indo-European traditions to the animals of the upper and lower worlds.

1.4.3. Animals of the gods in the Old Hittite tradition

In Old Hittite tradition the wild animals of the Middle World are united under the generic term *šiunaš ħuitar* ‘animals of the gods’. They include the leopard (*paršanaš*, Sumerogram UG.TUR), the wolf (*ulippanaš*, Sumerogram UR.BAR.RA), the lion (Sumerogram UR.MAH), the bear (*ħartaggaš*, Sumerogram AZ), the wild boar (Sumerogram ŠAḪ.GIŠ.GI ‘reed pig’), and the wild sheep (Sumerogram ŠEG₉.BAR). This same ordering is observed in the ritual of KBo X 23 and KBo III 8, except for the shift of the wild sheep ŠEG₉.BAR to the marked first place and the semantically dubious *šaša* ‘hare’(?) in fifth place.

The earliest Hittite text with such an enumeration of animals (Goetze 1962:29) is the Anittas text, where there are two fragmentary variants of the sequence: *lion, pig, wild boar, bear*, with the basic ordering beginning with *lion*, elsewhere found in the third or fourth place, and (with connective *LU.Ú* ‘or’) *leopard — lion — antelope, mountain goat* (Sumerogram DĀRA.MAŠ); the second sequence is repeated in a number of other, ritual, texts, e.g. KUB XII 62 I 16-17. Lines 60-63 read (Giorgadze 1965:92, 98, Neu 1974): *ša-ni-ya ši-wa-at* [2 UR.MAH 70 ŠAḪḪI.A 1 ŠAḪ.GIŠ.GI(?) 1] *ME* 20 AZḪI.A *LU.Ú* [UG.TUR *LU.Ú* UR.MAHḪI.A *LU.Ú* DĀRA.MAŠ] *LU.Ú* DĀRA Û *L[Ú.Ú ... URUNe-e-ša A.NA URU.YA ú-da-aḫ-ḫu-un]* ‘that same day I brought to the city Nesa, my city, 2 lions, 70 wild boars, 1 wild boar (? — ‘reed pig’), 120 bears;²⁶ a leopard, lion, antelope, or mountain goat’. This passage is of par-

26. The number of bears (120) is high in comparison to that of the other animals. This finds an interesting parallel in ancient Mesopotamian tradition, where two lists of animals delivered to a menagerie show 457 and 157 bears (Gelb 1975). Neu doubts (1974:31-32, following Otten) that the Sumerogram AZ meant ‘bear’ in Hittite as in Akkado-Sumerian, suggesting instead that it was a generic term (*Oberbegriff*) for wild animals. This is unfounded, since the inclusion among such wild animals of antelopes (DĀRA) and mountain goats (DĀRA.MAŠ), mentioned together with lions (UR.MAH) and leopards (UG.TUR), is debatable. In addition, AZ in Hittite texts usually refers to a particular wild animal, while *šiunaš ħuitar* is usually found as a generic term for animals in general or ‘animals of the gods’. For example, in KBo X 25 VI 4-7, after the generic term DINGIRMEŠ-na-aš *ħu-u-i-tar* ‘animals of the gods’ follow UG.TUR ‘leopard’ (made of silver), UR.MAH ‘lion’ (of gold), ŠAḪ.GIŠ.GI ‘wild boar’ (silver), ŠAḪ.GIŠ.GI ‘wild boar’ (lapis lazuli), AZ ‘bear’ (silver). This enumeration of animals largely coincides with that of the Anittas text.

ticular interest since it depicts the founding of the king's ritual menagerie with its wild 'animals of the gods'. Numerous typological parallels to this can be found in ethnographic data from other traditions, in particular African ones (for imperial leopards in such a menagerie from Benin see Melzian 1955:103ff.).

The Hittite ritual KBo III 8 III 27-29 was mentioned above as enumerating wild animals in connection with the sacred evergreen tree *Gišeya-*, which symbolizes the Cosmic Tree in the Hittite tradition. This passage indicates the hierarchical ordering of animals in relation to the trunk of the tree: ŠEG₉.BAR *kat-ta-an* *Gišeya la-a-at-ta-at* UG.TUR-*aš-ša ta-aš-ša-i pí-di la-a-at-ta-at u-li-ip-na-aš-ša-an pá-r-ga-ú-e la-a-at-ta-at* UR.MAH₃ *za-am-na-aš la-a-at-ta-at* 'the wild sheep was untied under the evergreen tree, the leopard was untied on the most important place. The wolf was untied up above. The lion was untied at the base (of the tree)' (the same animals had been tied up — *ḫamikta* — in the same order and in the same places in the preceding part of the ritual).

1.4.4. Parallels to 'animals of the gods' in other Indo-European traditions

Individual details of the Hittite mythic image of wild animals at the Cosmic Tree coincide with elements of other Indo-European traditions, which points to the great antiquity in Indo-European of those components. In the Germanic tradition wolves were sacrificed to Odin/Wotan (OIcel. *Óðinn*, OHG *Wuotan*, OE *Wōden*), who is associated with the Cosmic Tree; they were hung on ritual pillars called 'wolf trees': OE *wulfhēafod-trēo* 'wolf-head tree', *waritrēo* 'wolf-criminal tree', cognate to OSax. *waragtreo* 'criminal tree', OIcel. *vargtré* 'wolf tree'. In addition to such obvious correspondences, there are noteworthy combinations of ritual animals which were unlikely in the ecological context of the historical Germanic tribes: a wild boar and a lion on a Germanic shield from the fourth century B.C. (cf. the same combination in the Anittas text) and even the combination of leopard and lion with boar and bear attested in medieval Germanic tradition in the genre of dreams about wild animals (Beck 1965:138-45, q.v. for a possible reflex of the same tradition in the Song of Roland). In other Indo-European traditions we find further correspondences both to individual elements of the set of Middle-World animals (especially cattle and hoofed animals such as deer, wild boars, and wild goats) and to the set as a whole.

The term 'animals of the gods' or 'divine animals' — Hitt. *šiunaš ḫuitar* — for the animals of the Middle World symbolizes their contrast to domestic animals: wild animals belong to the gods, while domestic animals belong to

people.²⁷ The antiquity and Proto-Indo-European nature of this image can be deduced from the existence of the very same image in the Balto-Slavic tradition, where wild animals are characterized as God's animals: Latv. *dieva vērši* (in folk songs) 'wild animals', lit. 'God's animals' (see above for Latv. *dievs* 'god', cognate to Hitt. *šiu-na-* 'god'), *dieva suns* 'wolf', lit. 'God's dog', *dieva zuosis* 'wild geese', lit. 'God's geese' (who belong to no one):²⁸ Mühlenbach and Endzelin 1923-1932:I.486. Also related is Slavic *divijī* 'wild' (see Vasmer 1953-:I.351 [1964-1973:I.513]), ORuss. *zvěri divii* 'wild animals': *v" stadě divix" ovec* 'in a flock of wild sheep', *divii olen* 'wild deer', etc. (Sreznevskij 1958:I.662).

Characteristic of the various Indo-European traditions is the ability of people to turn into 'God's animals' through ritual metamorphosis. Changing ritually into a wild animal such as a wolf, bear, or leopard conferred sacred status, bringing the person close to the gods through the intermediary link of the gods' animals. This is clearly the status of the werewolf in early Germanic tradition, where sacred animals (Oicel. *fylgja* 'protective spirit', especially a wolf, bear, wild bull, etc.) are a connecting link between people and gods (Beck 1965:147).

1.4.5. *Animals of the Lower World*

The divine animals of the Middle World are opposed to those of the Lower World, located at the roots of the Cosmic Tree, in an underground kingdom or under water. The Lower World seems to have been symbolized in Indo-European by the term **bhudh-n-*, reflected in Skt. *budhná-* 'bottom, base, support, root', Av. *būna-* 'bottom, support, depth', Arm. *an-dund-k'* 'abyss', Gk. *puthmén* 'bottom, base, stem, trunk', Lat. *fundus* 'bottom, base, limit', OHG *bodam* 'bottom, base' (Ger. *Boden*), OE *botm* (Engl. *bottom*), *bodan* 'base, foundation'. In Sanskrit cosmogony the mythic serpent *Áhi- Budhnyá-* (lit. 'serpent of the depths') lies beneath the Cosmic Tree; its name and functions correspond to those of the Greek Python (from the same root **bhudh-*: Toporov 1976:5-6, q.v. for possible Baltic and Slavic mythic correspondences). A functional equivalent to the Sanskrit and Greek serpents is the serpent at the roots of a tree in the Edda (Dumézil 1959) and the serpent (Sumerogram MUŠ) in Hittite rituals, e.g. *ša-ma-an-ku-ur-wa-an-du-uš-kán* MUŠ^{HI.A-uš} (acc. pl.) 'bearded serpents', KBo III 8 III 7. Aquatic animals such as fish, beavers, otters, and others also belong to the Lower World.

27. Thus the Hittite version of the Hurrian tale of the hunter Kesshi relates that 'the gods were angry at Kesshi because of the sacrifices and they hid all the animals from him': DINGIRMEŠ-*eš-kan* [*Keššiya išpanduzzi šer kartimmiyawanteš nu-šši huitar human piran arḫa munnair*, KUB XVII 1+XXXIII 121.

28. There is a typological parallel in Siberian traditions, e.g. Ket *ešda še'!* 'deer of (the Sky God) Eš', i.e. 'wild deer' (in contrast to domesticated reindeer).

1.4.6. *Animals of the Upper World*

At the top of the Cosmic Tree are the animals of the Upper World, which was evidently designated by the term ***Hwe(i)**.²⁹ These are the birds (especially eagles: Hitt. *haraš* MUŠEN 'eagle', Russ. *orel* 'eagle', Lith *erēlis* 'eagle', Goth. *ara* 'eagle'), as is supported by the concurrence of virtually all archaic Indo-European traditions (see Wilke 1922).

1.4.7. *A general classification of wild animals*

The world of wild animals was thus divided into the middle, lower, and upper worlds. These categories can be used as semantic features to distinguish the three groups. Chapter 2 below, which deals with wild animals, will analyze them in the order *middle*, *lower*, *upper*, an organization which reflects the earliest Indo-European worldview. Within each of the three worlds, the animals will be presented in the order reflecting their functions in the majority of historical traditions, while conclusions about the archaic significance of each are based on the comparative data presented in that section.

The Indo-European division of animals into three worlds associated with three parts of the Cosmic Tree can be represented as in Table 1.

1.4.8. *The typological status of the Indo-European classification of living things*

The classification of living things into individual hierarchical classes and subclasses distinguished by semantic features reflects the earliest conceptions of the Indo-Europeans about the world around them and its relation to people. This classification, reconstructed by comparison of classificatory lexemes and archaic ritual traditions, reflects a relatively high level of pre-scientific views of nature and the place in nature of individual members of the living world. Such a reconstruction is not just a metalanguage for the semantic analysis of an ancient culture, but fragments of the actual conceptual system created by the speakers of the Indo-European protolanguage and its dialects and reflected in the semantics and the combinatory properties of the lexemes.

29. The form is derived from the root meaning 'blow' (of air, wind): Skt. *vāti* 'blows', Av. *vāiti*, Gk. *dēsi* 'blows'; ***Hwentb-** 'blowing; wind': Skt. *vānt-*, Gk. *dēnta* (acc.) 'blowing'; Hitt. *huwant-* 'wind', Toch. A *want-*, B *yente* 'wind', Lat. *uentus* 'wind', Goth. *winds*. This is the source of dialect terms for 'air', 'atmosphere', 'weather', 'storm': Gk. *a(w)ēr* 'air, gloom, fog', *della* 'storm, whirlwind', OCor. *awel* 'weather'. The generic term for birds in Indo-European is formed from the same term for the Upper World: Skt. *vī-*, Lat. *avis*, etc. (discussed below).

Table 1

Wild animals of the three worlds

*Hwe(i)- 'Upper World'	bird, eagle crane raven, crow thrush, starling, sparrow black grouse, capercaillie woodpecker, small songbirds, finch goose, water bird, swan, duck
*medhyo- 'Middle World'	wolf bear leopard, panther lion lynx jackal, fox wild boar deer, (European) elk, antelope wild bull, aurochs, bison hare squirrel, polecat, ermine monkey elephant
*bhudh-n- 'Lower World'	serpent, snake, worm otter, beaver, water animal mouse, mole turtle crab toad, frog fly, gadfly wasp, hornet louse, nit fish, salmon

The relatively high level of these ancient conceptions, with their elements of logical, zoological, and sociological analysis, should not be taken for something unusual or unexpected in the ethnographic typology of so-called primitive peoples. Ethnographic works of the last decades, in particular those of Lévi-Strauss, have established the strikingly high level of classificatory thought among such peoples, which can be compared to recent scientific classification. For instance, terminology among the Guarani of South America “forms a well-thought-out system and — with certain exceptions — reveals a definite similarity to our scientific nomenclature. These primitive Indians did not give terms to natural phenomena at random, but called special tribal councils to establish terms that would better correspond to the features of species, while distinguishing groups and subgroups with great accuracy” (Lévi-Strauss 1962:61). It is particularly interesting that the Navajo, who call themselves the ‘great classifiers’, divide living beings into two categories on the basis of speech. Those without language include animals and plants, with further classificatory subdivisions (Lévi-Strauss 1962:54), in striking concordance with the classificatory categories of the Indo-Europeans. Such typological parallels from ethnographic sources provide a verification of the essential correctness of our reconstructed Indo-European classificatory system.

A reconstruction of this type makes it possible to distinguish individual subdivisions of nature by their semantic features and label them with their particular generic terms. The classificatory analysis of each subgroup can be given together with its constituent lexical and semantic elements. This is the approach that will be taken in the next chapters, which survey the three subgroups presented above: wild animals, **ǵʰwer-*; domestic animals, **pʰekʰu-*; and plants, **bʰel-*.

Chapter Two

Indo-European conceptions of wild animals, and names for them

2.1. Animals of the Middle World

2.1.1. Wolf

2.1.1.1. The earliest Indo-European words for 'wolf'

The semantic unit 'wolf' is represented by several lexemes in Indo-European. One of the earliest ones, showing variations correlated with different chronological levels of Indo-European, is ***w_lkho-**: Skt. *vṛkaḥ*, Avest. *vahrka-*, Gk. *lúkos*, OCS *vlikŭ*, Lith. *vilkas*, Alb. *ulk*. A feminine stem meaning 'she-wolf' arises independently in some dialects: Skt. *vṛkīḥ*, Russ. *volč-i-ca*, OIcel. *ylgr*; Lith. *vilké*; Gk. *lúkaina* (Meillet 1937 [1938:395]). There is also a phonetic variant in ***-ph-**, ***w_lph-**, in individual dialects: Hitt. *ulippana-*, Goth. *wulfs*, Lat. *lupus*; also Arm. *gayl*, with regular absence of final ***-ph-**.¹

Parallel to this root, another Indo-European base meaning 'wolf' can be reconstructed, ***weit'-(n)-**: Hitt. *wetna-*, OIcel. *vitnir*, Slovene *vedanec*, *vedomec*, *vedavec*, Ukr. *viščun* 'werewolf', OCz. *vědi* 'she-werewolves' (Jakobson 1966a:346-50).

The fact that there are several words for 'wolf' of Common Indo-European date shows that the wolf was widespread throughout the Indo-European territory. It also indicates its cultic and ritual significance, which is clearly attested in the oldest Indo-European traditions.

2.1.1.2. The ritual role of wolves in ancient Indo-European traditions

In Old Hittite tradition the wolf plays a special role, functioning as the embodiment of sacral qualities. In particular, wolves and wolf packs serve as an

1. ***w_lkho-** and ***w_lph-** ultimately break down into a root ***wel-** with the original meaning 'lacerate, tear apart; wound; kill' and suffixes ***-kho-** and ***-ph-**, which yield the two Indo-European dialectal variants. For the original meaning of ***wel-** cf. Lat. *uellō* 'tear, tear apart', *uolnus* 'wound', Gk. *oulē* 'wound', OIr. *fuil* 'blood', Mir. *fuili* 'bloody wounds', Goth. *wilwan* 'plunder', *wulwa* 'robbery, brigandage', OIcel. *valr* 'corpses on battlefield', Toch. A *wāl-* 'die', Luw. *u(wa)lanti-* 'dead', Hier. Luw. *wal(a)-* 'die' (Hawkins 1980). Consequently, the original Indo-European meaning of 'wolf' was 'animal which tears apart (its prey)', 'killer beast'. For other derivatives of ***wel-** with the same meaning 'beast of prey', see below.

image of unity and omniscience. Thus King Hattusilis I (who reigned in the seventeenth century B.C.), addressing his council, urges his warrior subjects to unite 'like a wolf pack': *ú-e-it-na-aš ma-a-an pa-an-gur*. Dressing in wolf skins (cf. Hitt. LÚMEŠ UR.BAR.RA 'wolf people', i.e. people dressed in wolf skins, KBo XVI 68 I 13; 78 IV 9 et al.) conveys magical power, evidently conferring omniscience on the wearer, and may have been symbolic of a special juridical status. The formula for people turning into wolves, attested in *zik-wa UR.BAR.RA-aš kištat* 'you have turned into a wolf' of the Hittite Laws (§37), resembles Skt. *vṛko hí śāh* 'he is a wolf', referring to a special juridical status in the wedding ritual of kidnapping the bride (Watkins 1970a).²

Parallels to these Hittite formulas and rituals can be found in a number of other early Indo-European traditions, which testifies to their Proto-Indo-European character and reconstructibility. In ancient Greek tradition, a person 'becomes a wolf' (*lúkōi genésthai*, Plato: *Republic*) in connection with a special ritual form of killing. This corresponds exactly to a Germanic formula: in an Old Icelandic peacemaking oath a murderer 'shall be called a wolf' (*skal svá víða vargr heita*): Ivanov 1975.

There is a striking parallel to the Old Hittite ritual of putting on wolf skins, and to dances of 'wolf people' (LÚMEŠ UR.BAR.RA), i.e. those dressed in wolf skins, in an ancient Germanic tradition where warriors are depicted as wearing wolf skins and referred to as wolves (OE *heoruwulfas*, *wælwulfas* 'wolf warriors'). The custom is also found in Gothic: in Byzantium, Christmas was marked by ritual dances of Gothic warriors in wolf skins down to the end of the Byzantine period (see Kraus 1895). It is also noteworthy that the word 'wolf' was frequently used in Germanic personal names such as Goth. *Ulfilas* (see Kock 1924), OIcel. *Ulf-björn*, *Björn-olfr*, OHG *Wulf-bero*, OE *Bēo-wulf*; also relevant is the Frankish term *werwulf* 'werewolf', lit. 'person wolf'.

Ancient Slavic and Baltic traditions exhibit an especially clear correspondence with the Hittite and Germanic ones in a ritual transformation of a human into a wolf, which confers supernatural strength and the special status of vatic or all-knowing person (Jakobson 1966a, Ridley 1976). The omniscient Wolf King of the Slavs had wolf hair growing on his head, thus Slovene *voščja dláka* 'wolf hair, wolf locks' (cf. OIcel. *vargshár*, id.); the same expression subsequently provides the name for werewolves: Russ. *vurdalak*, Bulg. *valkolak*, etc. A distinctive characteristic of 'wolfskin people' and werewolves was their omniscience. This must reflect an ancient tradition, going back to Proto-Indo-European, of omniscient humans in wolf form (cf. Ukr. *viščun*, OCz. *vêdi*, etc.), reflected in the evident link of **weit*-(n)- 'wolf' and **weit*- 'know' (Gk. *oîda*, Skt. *vêda*, Russ. *vedat*).

2. Cf. the wolf (*vṛkahi*) as the image of a thief or robber (*aghásaisa-*) in the Rîgveda, I, 42, 2-4.

2.1.1.3. The ritual status of the wolf, and dialect terms for 'wolf'

The special cultic and ritual status of wolves in Indo-European traditions, and their complex of sacred properties, give rise to the descriptive word for 'wolf', cognate to **weīt-* 'know', which coexists with original **włkho-* ~ **włph-*. These two roots are distributed throughout the Indo-European dialects, variously in the ritually marked sense and as the basic word for 'wolf'. The heavy functional load of the semantic element 'wolf' and the tendency to taboo certain original animal names may explain the appearance of new, sometimes euphemistic, formations meaning 'wolf' in various dialects (Zelenin 1929-1930).³ For instance, in Latvian we find ancient euphemisms such as *dieva suns*, lit. 'god's dog', *meža suns* 'forest dog'.

The wolf as a predatory animal is designated with a new term cognate to the root **dheu-* 'smother', 'crush', 'kill', attested in OCS *daviti* 'smother', 'crush', Goth. *afdauiþs* 'tormented' (causative participle), *þata diwanō* 'mortal' (*tō thnētōn*), *undiwanei* 'immortal' (*athanatía*) (see above for the term for 'mortal; human' from this root).⁴ Also formed from this root are ancient Balkan Indo-European words: the name of the Maionian god *Kandaulas*, which according to Hipponax means 'dog-strangler' (*kunágkhēs*), interpreted as one of the incarnations of an Indo-European wolf god to whom dogs were sacrificed (O. Masson 1962:106). Such words are attested with the meaning 'wolf' (etymologically 'killer, smotherer') in forms like Phrygian *dáos* (Hesychius) and Illyrian *Daunus* (cf. also *thaûnon* · *thērion* in Hesychius).

2.1.1.4. Ethnonyms and toponyms connected with 'wolf'

Wolves were important in Indo-European tradition throughout its entire history, from Proto-Indo-European to historical times, as is testified by widespread

3. This could also be the explanation for the Germanic designation of the wolf as 'criminal': Olcel. *vargr*, OHG *warg*, OE *wearg* (Jacoby 1974), cf. Goth. *ga-warg-jan* 'condemn, sentence', cognate to Hitt. *hurk-el* 'repulsive crime' (Puhvel 1971), cf. also LÚMEŠ *hurkilaš* 'people of crime' as the name of mythological beings who capture a wolf in their hands (in KUB XII 63 I 21ff.). The pan-Germanic term *vargtré* 'wolf tree' mentioned above (II.1.4.4) can be compared to Hitt. *hurki-* 'wheel' (§198 of the Hittite Laws, Sumerogram GİŠDUBBIN, DDUBBIN 'divine wheel' in the Autobiography of Hattusilis, I.36, in a context concerning the punishment of a criminal). Cf. the ritual meanings of the same root in Slavic: ORuss. *voroziti* 'foretell', *vorozēja* 'witch', *vorog* 'enemy', *vorozha* 'witchcraft', Russ. dial. *vorozejka*, a weathervane consisting of a pole stuck in the ground and a horizontal stick at the top with a bundle of tow at the end (Filin 1965-:5.109) (cf. the meaning of Olcel. *vargtré*, referring to a ritual pillar).

4. **włkho-* and **włph-* had essentially this same original meaning; cf. Homeric *lússa* 'warrior's rage' (lit. 'rage of wolf') from *lúkos* 'wolf': *lússa dé hoi kêr aièn ékhe kraterē* 'his (Achilles') heart was forever ruled by a powerful wolf's rage', Iliad 21.542-43 (see Lincoln 1975). However, this original meaning of 'wolf' could subsequently have been lost, which made possible the rise of new terms for 'wolf' based on the same characteristic.

ethnonyms and toponyms containing the root 'wolf'. Whole peoples and countries were named for the wolf, due to the place given to wolves in the cultural traditions, probably of totemic origin, of various Indo-European tribes. The following examples are listed in order from west to east.

Ancient Italy: the tribe names *Lukani* (transmitted via Greek), *Hirpini* from **hirpus* 'wolf' (cf. the oracular prophesy reported by Servius, according to which *Hirpi Sorani* 'lupos imitarentur', 'imitate wolves'), the Illyrian tribe *Daúnioi*.

The ancient Balkans: Strabo's name for the Dacians, *dáoi* 'wolves' (Eliade 1959); north Balkan *Daúñion teíkhos* 'wolf wall' (in Stephanus Byzantinus).

Greece and the Greek part of Asia Minor: *Lykaonia*, related to the name of the mythic king Lykaon; the city name *Lukósoura*; possibly *Lukka-*, a name in Hittite texts for a region of Asia Minor; the tribe name *Orka* (*Orkoi*) in Phrygia (Eisler 1951:137).

Iranian: the Sarmatian tribe *Oûrgoi* 'wolves' (Strabo); Old Iranian formations like **Vrkāna-* (in Elamite transmission *mi-ir-ka-nu-ya-ip* 'inhabitants of Hyrcania' beside the *Hyrkanoi* of classical authors); *Hyrkaniā*, located on the southeastern shore of the Caspian Sea and in the Transcaucasus (Cereteli 1963).

2.1.1.5. *Typological and areal parallels to the status of wolves among the ancient Indo-Europeans*

Striking parallels to the Indo-European wolf cult are to be found in South Caucasian (Kartvelian) culture. A wolf cult occupies a special place in the earliest traditions. The depiction of people in wolf masks is a basic motif of ritual art. Traces of the wolf cult are especially clear in Svan traditions, where as in ancient Indo-European wolves are a symbol of a certain type of social organization (Bardavelidze 1957:37ff.). Moreover, Svan tradition equates the mobility of wolf packs with that of human groups: the organization of wolves is a reflection in nature of human social organization (Charachidzé 1968:482).

In Old Georgian tradition the significance of the wolf cult is reflected in the names of the rulers of Iberia, which contained Iranian words meaning 'wolf', for example the epithet of the Old Georgian king Vakhtang Gorgasala 'Vakhtang Wolfhead'; the very name Vakhtang may be Iranian, from **warx-tang* = *vahrka-tanū-* 'wolf-bodied' (cf. the Ossetic hero's name in the Nart epic, *Wærxæg*, from 'wolf' according to Abaev 1949:I.187, 1965:95). The name of ancient Iberia itself, **Vrkān-* = *Hyrkaniā*, goes back to the same Iranian word for 'wolf' (Cereteli 1963). As a result of the cultic status of wolves, the original Kartvelian word for 'wolf' undergoes taboo and is replaced by borrowings from other languages. Georgian *mgel-i*, Mingrelian *ger-i* are probably taken from Armenian (cf. Arm. *gayl* 'wolf'); Svan *txer* 'wolf' is obviously connected to Gk.

thér 'wild animal'. Similarly, in Ossetic, where the wolf was an ancient totemic animal and the mythic ancestor of the tribe, the original Indo-European word was tabooed and is preserved only in mythic names. It is replaced by a word of apparent Turkic origin, *bīræǵ/beræǵ* (Abaev 1958:I.262-63, 1949:I.48-49).

The wolf cult plays a special role in the South Caucasus, and many traits of the tradition connected with ritual status of wolves coincide in their essential elements right down to striking details with the ancient Indo-European traditions. The coincidence of this entire complex unites the Indo-European and South Caucasian traditions with a wider circle of mythic conceptions characteristic of a much broader area which extended far to the east (see Alföldi 1974:32, 150ff. for the wolf cult in this area).

According to the most recent archeological data, the earliest evidence of wolves is observed at the turn of the eighth and seventh millennia B.C. in a broad area of Southwest Asia, including continental Greece: Thessaly, eastern Asia Minor, the Iranian plateau, and Palestine, as well as some regions of western Europe and England (Berger and Protsch 1973:223).

2.1.2. Bear

2.1.2.1. The Indo-European word for 'bear'

Another Proto-Indo-European word denoting a large predator is **H₂rtḱh₂*, with regular correspondences across the early Indo-European dialects: Hitt. *ḫartagga*,-⁵ Skt. *ṛkṣaḥ*, Avest. *arəšō*, Gk. *árktos*, Arm. *arj*, Lat. *ursus*, Mlr. *art*.⁶ That the bear was well established in the ecological environment of the ancient Indo-Europeans can be inferred from the presence of this word in Proto-Indo-European and its reflexes in the basic dialect groups.

2.1.2.2. The cultic role of the bear in Hittite and other ancient Indo-European traditions

Although the bear has a role in ancient Indo-European tradition, its ritual significance is less than that of the wolf, with which it is often associated in

5. Contrary to Otten's suggestion (see Neu 1974:32, 103) that *ḫartagga*- should be translated 'wolf' rather than 'bear', 'bear' is the more probable translation and in accord with the word's etymology (see Watkins 1975h). In addition, the contextual interpretations of the word indicate 'bear', not 'wolf'; for instance, Hittite texts (KUB XXIX 1 I 30 and others) mention the ability of the *ḫartagga*- to climb trees. Furthermore, at least two words for 'wolf' are attested in Hittite: *ulippana*- and *wetna*- (see 2.1.1.1 above).

6. This Celtic word is borrowed from Celtiberian into Basque as well, in the form *hartz* 'bear' (Šišmarev 1941:18).

certain rituals and hence in ritual terms. In Hittite rituals, wolf people dance together with bear people (*LÚḫartagga*-, see Jakob-Rost 1966), which is analogous to the ritual dance of Gothic warriors in bear and wolf hides (Kraus 1895). In ancient Germanic compound personal names ‘bear’ often combines with ‘wolf’: Oldcel. *Ulf-björn*, *Björn-olfr*, OHG *Wulf-bero*, *Ber-ulf*, West Goth. *Bēr-ulfus*.



Illustration 1.
Vessel in the form of a bear. Ancient Balkan culture,
6th millennium B.C.

Hittite facts are particularly significant for the Indo-European tradition. As early as the ancient text KBoVII 14 a bear figures in a ritual sense: *nu-ut-ta ḫar-tág-gán ma-a-an [...] iš-ki-mi nu-tu-uh-ḫi-ya-at-ti-it a-ak-ti* ‘and I will [crush?] you like a bear and you will suffocate’ (Gamkrelidze 1961:275-76). The ritual significance of bears is also visible in Hittite fertility rituals, in which the bear is a symbolic inseminator of trees: *ḫartaggaš-ma-šmaš šara arkiškitta* ‘and the bear mounted you’⁷ (KUB XXIX 1 I 30; see Watkins 1975h). In this ritual, as in the Anittas inscription, the bear is ranked together with other ‘animals of the gods’, in particular the leopard and the lion.

2.1.2.3. The taboo on the word for ‘bear’ and its euphemistic replacements

As is no surprise, due to its cultic significance the original word for ‘bear’ undergoes taboo in various Indo-European cultures. In Slavic, the original

7. The verb *ark-* corresponds to Russ. *ērzať*, Beloruss. *ērzac’* ‘fidget, rub, abrade’ (in its original sexual meaning) and doublet Russ. *ērgat’* (Filin 1965-), and the cognate noun *arki-* ‘testicle’ (pl. *ar-ki-i-e-eš*, KBo XVII 61 Rs. 15) is etymologically related to Gk. *órkheis* ‘testicles’, Av. *ərəzi* (dual), Arm. *orjik’*, Mlr. *uirge* (see Watkins 1975h).

word is replaced by a descriptive one based on the bear's liking for sweets: Russ. *medved'*, RChSl. *medvěď*, Czech *medvěd* from PIE **medh^hw-et'* -> Common Slavic **medvěd-ī* 'honey-eater'; cf. Skt. *madhuvād-* 'sweet-eater'.

In Germanic, where the bear like the wolf was a major sacred animal (Beck 1965:21ff., 146ff.), the taboo replaced the original term with a descriptive one based on the color of the brown bear, going back to Indo-European **b^her-* 'brown': OHG *bero* 'bear' (Ger. *Bär*), OE *bera* (Engl. *bear*), OIcel. *björn* (Gottlieb 1931:39-41). In addition, Germanic attests a descriptive term reminiscent of the Slavic one: OE *Bēowulf* 'bear', lit. 'bee wolf'.

In Baltic another euphemism arises, which may be a phonetically altered form of the original word: OPruss. *tlok-* in *Tlokunpelk* 'Bear Swamp', from *clokis*; Lith. *lokys*, Latv. *lācis* 'bear'.

Replacement of the original word for 'bear' takes place primarily in the Balto-Slavic-Germanic area, which testifies to the greater cultic significance of the bear in this area compared with other Indo-European groups. In this respect the Balto-Slavic-Germanic culture area exhibits closer links with northern and eastern Eurasian cultures (see Alekseenko 1960, Krejnovič 1969).

2.1.2.4. The typology of the Indo-European bear cult

In Indo-European tradition the bear cult takes second place in ritual significance to the wolf cult. The wolf cult comprises both the biological and the social sphere: the wolf is a symbol of the unity of the whole tribe, a special social status, a symbol of omniscience granted to the leader of the tribe, and so on. In contrast, the bear symbolizes primarily the biological sphere: the fertility of nature (cf. the mythic image of the bear's son and the rite of marriage with a bear in the Germanic tradition, Beck 1965, de Vries 1956:I.362ff.; in Slavic tradition, Ivanov and Toporov 1965:161; and in Greek traditions), and the destruction of life ('death of the bear').⁸ Only in isolated late Indo-European cultures does the ritual and cultic significance of the bear extend to other spheres.

In a number of historical Indo-European traditions there is a substantial decrease in the cultic role of the bear, evidently due to ecological conditions of the later territories of these dialects. In particular, in the Sanskrit tradition the bear had lost its prominence by an early date; in the R̥gveda the ancient term for bear, *ṛkṣa-*, is found only once while *vṛka-* 'wolf' occurs 23 times and the term for 'lion' 15 times (Grassmann 1873:278, 1325, 1515). In contrast, for the

8. That the bear is a symbol of biological fertility unlike the rest of the animals associated with royal power is clear from the Hittite ritual KUB XXIX 1 cited above, where the bear is mentioned only in connection with the fertility of trees, while the lion and leopard are also mentioned in the sections having to do with renewal of the king's holy power.

Hittite tradition (as, incidentally, in Mesopotamia), a high number of bears is characteristic (see II.1.4.3 above on the Anittas inscription which mentions 120 bears in a menagerie), which may be interpreted as indicating that bears were particularly widespread in the ancient Near East.

In the South Caucasian (Kartvelian) culture area the bear cult is considerably less significant than the wolf cult. This must be responsible for the fact that the original word for 'bear' is preserved in Kartvelian (Geo. *datv-i*, Mingr. *tunt-i*, Laz *mtut-i*, Svan *dāšdw*), while a variety of terms is found for 'wolf'.

2.1.3. Leopard or panther

2.1.3.1. The leopard in Old Hittite tradition

In the Hittite series of 'animals of the gods' the leopard (Hitt. *paršana-*, Sumerogram UG.TUR, which may equally well mean 'panther' or another large feline) takes the first, most important, place (see II.1.4.3 above; also the sequence *lion, leopard, bear* in the archaic ritual KUB XXIX 1). Furthermore, the leopard (*Felis pardus* L.), in contrast to the other animals, is credited with the ability to dance, as seen in the ritual KBo X 24 III 24: *nu pār-ša-ni-li tar-ú-i-eš-kán-[zi]* 'and they dance leopard-style', evidently describing a ritual dance performed in leopard skins. In a fertility ritual, the bear functions as the embodiment of masculine fertility while the leopard and lion may represent the female side: UR.MAḪ-*aš kattan šeškit* UG.TUR-*aš-(š)maš kattan šeš-kit ḫartaggaš-ma-šmaš šara arkiškitta* 'the lion(ess) slept under (you), the leopard slept under you, the bear climbed up onto you' (KUB XXIX 1 I 29-30).



Illustration 2.

Fresco depicting a leopard. Çatal Hüyük, 7th–6th millennia B.C.

2.1.3.2. The Hittite and Indo-Iranian terms for 'leopard'

The Hittite word *paršana-*, with suffixal *-ana-* (cf. *ulipp-ana-* 'wolf') and root *parš-*, corresponds to Persian *pārs ~ fārs* 'panther', the source of western Mongolian *p'ars* (fourteenth century), *bars* 'snow leopard', 'tiger' (Vladimircov 1917, 1929:341) and Old Turkic *bārs* 'tiger' (also a symbol in the twenty-year animal cycle, *bars jıl* 'year of the tiger');⁹ some Turkic languages preserve the meaning 'panther', the probable source of Russ. *bars* 'leopard' (see Dmitriev 1962:555).

The Iranian forms in *-s-* (Pers. *pārs ~ fārs*, Sarikoli *pis* 'snow leopard, leopard', Paxalina 1971:130) are counterpoised to forms in *-d-*: Sogd. *pwrδ'nk*, Pashto *prāng*, Pers. *palang* 'snow leopard' (with **rd > l*); the Persian form explains Oss. *fælank/færank* 'leopard' (Abaev 1958:I.450) and (via Tajik) Pamir forms such as Wakhi *pəlang* 'snow leopard', Ishkashim *pəlang* (Paxalina 1975:242, Grjunberg and Steblin-Kamenskij 1976:421). The form in **-d-* corresponds to Skt. *pr̥dāku-* 'panther, tiger' (attested in Sanskrit lexicographers, Mayrhofer 1963:II.301ff., 335; cf. Fussman 1972:II.207-8). Greek also shows the same form: *párdalis, pórdalis, párdos* 'panther, leopard', *pardalée* 'leopard skin'.

2.1.3.3. The role of the panther or leopard in Greek tradition

The panther or leopard in the Greek tradition, especially in Homer, displays striking ritual closeness to that of the Hittite tradition. In the *Iliad* (10.29-31), king Menelaus covers his back with a leopard skin before putting on his helmet and taking his spear:

Παρδαλέη μὲν πρῶτα μετάφρενον εὐρὺ κάλυψεν
ποικίλῃ, αὐτὰρ ἐπὶ στεφάνῃν κεφαλῇφιν αἰείρας
θήκατο χαλκείην, δόρυ δ' εἵλετο χειρὶ παχείῃ

9. In Indo-European traditions the semanteme 'tiger' evidently appears later, in the individual dialects (for its absence in Proto-Indo-European see Thieme 1964:596). To render this sense a word is derived from **(s)theik-* 'stab; sharp, sharpened' in Greek: *tígris* 'tiger' (from 'sharp', Av. *tiyra-* 'sharp', *tiyri-* 'arrow', OPers. *tigra-* 'sharp', see Watkins 1971:1543), borrowed into Latin and the modern European languages. The cultic role of the tiger (*Felis tigris* L.) is obviously minimal in the historical Indo-European traditions. Such a role is characteristic for ancient Southwest Asia (in Mohenjo-Daro, where the tiger appears in a sacred sequence of animals as an equivalent to the leopard or panther of the traditions to the west; in India proper the place of the tiger, associated with the north in the sacred animal symbolism, is later taken by the lion), Central Asia (cf. the Old Turkic animal cycle), and China, where the tiger functions in a system of five animals as the sole representative of those 'having fur' (L. Saussure 1920, Yuan Ke 1965:55-56, 72, Semeka 1971:105, 116). The tiger is not mentioned at all in the *Rigveda*, and only later, in the *Atharvaveda*, begins to replace the leopard as a symbol of royal power (Elizarenkova 1976:6, 232, 374). However, the leopard continues to function as a symbol of royal power also (*Atharvaveda* IV, 8).

‘First of all he mantled his broad back in a leopard’s
spotted hide, then lifting the circle of a brazen helmet
placed it upon his head, and took up a spear in his big hand’

And Alexander has a leopard skin on his shoulders (Iliad 3.16-18):

Τρωσὶν μὲν προμάχιζεν Ἀλέξανδρος θεοειδής,
παρδαλέην ὤμοισιν ἔχων καὶ καμπύλα τόξα
καὶ ξίφος
‘Alexander the godlike leapt from the ranks of the Trojans,
as challenger wearing across his shoulders the hide of a leopard,
curved bow and sword’

The leopard or panther is mentioned twice in Homer in enumerations of wild animals: in the Iliad in the series *jackals, panthers, wolves* (13.103: *thōōn pardaliōn te lúkōn*), and in the Odyssey in a more revealing context where the god Proteus, an old man (*gérōn*), turns into a series of animals which are depicted as mythological beings: first into a lion, then into a dragon, a leopard, a great wild boar, and finally a stream and a tree reaching upwards (Odyssey 4.456-58):

ἀλλ’ ἦτοι πρῶτιστα λέων γένετ’ ἠϋγένειος,
αὐτὰρ ἔπειτα δράκων καὶ πόρδαλις ἥδὲ μέγας σῦς·
γίγνετο δ’ ὑγρὸν ὕδωρ καὶ δένδρεον ὑψηπέτηλον
‘First he took on a whiskered lion’s shape,
a serpent then; a leopard; a great boar;
then sousing water; then a tall green tree’

In this passage the cooccurrence of ‘lion’, ‘panther’ (or ‘leopard’), and ‘wild boar’ together with ‘tree’ is highly significant in view of the Indo-European mythological tradition concerning animals of the gods.

2.1.3.4. The panther in Old Armenian legend

There is an extremely interesting semantic parallel to the Greek text in a mythic episode from an Armenian legend recounted by Moses of Chorene (History of Armenia I.26). The Median king Azhdahak (cf. Pers. *Aždahā*, Avest. *aži-dahāka*-, the legendary king of the Devis, with *aži*- ‘dragon, serpent’, cf. Skt. *Āhi- Budhnyā*- ‘Serpent of the Depths’) has a dream in which he sees, on a mountaintop in the ‘country of the Armenians’ (*yerkrin haykazanc*’), a miraculous woman dressed in ‘red-purple’ (*kin omn ciranazgest*) in labor

(*erkanc' ambr̄neal c'awov*). Suddenly she gives birth to three miraculous godlike beings (*cnaw kinn yarkarc eris katareals i diwc'azanc'*). The first of these beings, borne on a lion (*aceal i veray ariwcu*), sets off to the west; the second, on a panther (*i veray ancū*), sets off to the north; the third, on a huge dragon (*zvišapn arari sanjeal*), sets off in the direction of the Median kingdom (evidently to the southeast) and attacks it.¹⁰

Despite the Iranian etymology of the name *Azhdahak* and the thematic link with Media, the legend clearly reveals ancient mythological motifs expressed in archaic language. Compare in this respect the archaic Armenian hymn about the birth of the mythical being Vahagn (also in Moses of Chorene, I.31), where all the archaic Indo-European phraseology and mythic motifs coincide with those of the *Azhdahak* passage (see Watkins 1975h:518ff; for a detailed analysis of the hymn from the viewpoint of its Indo-European motifs see Dumézil 1969):

erknēr erkin erknēr erkir

erknēr ew covn cirani

'Heaven and earth were in labor,
And the purple sea was in labor'

In the passage from the *Odyssey* discussed earlier and in the Armenian *Azhdahak* legend the three mythic animals *lion*, *dragon*, *leopard* are the same. This testifies to the extremely great age of these mythological motifs, which must go back to an archaic period of Indo-European cultural development.

2.1.3.5. *The leopard or panther in medieval European traditions*

These comparisons give particular significance to analogous symbols of sacred animals which figure in prophetic animal dreams in medieval Germanic mythological traditions.¹¹ In these dreams we find a set of animals, real and mythic, which coincide with those in the Hittite, Greek, and Armenian traditions: lion, unicorn, leopard, sometimes bear and wolf (the latter in Fredegard, early 7th century, in connection with a ritual concerning relations

10. The association of animals with the four compass directions is an ancient motif which is reflected in Indo-European traditions. In the oldest Indic tradition the tiger, which functionally replaces the leopard in this culture, is associated with the north. In this connection it is interesting that in early Buddhist tradition four great kings associated with the four directions stand around Buddha's mother Maya during his birth and take the newborn child 'onto a spotted tiger's skin' (Mahāvastu III.315.2, Mahāvagga I.2.1, and others); cf. the Armenian myth mentioned above, where a miraculous being is borne on a panther and goes off to the north.

11. For the antiquity of animal dreams as a genre compare the Hurrian epic of the hunter Keshhi, passed down in its Hittite rendition: in a dream Keshhi goes hunting lions, and dragons (*elliyankuš*, KUB XXXIII 121 I 12) and other mythic animal-like beings (*damnaššaruš*, *ibid.* 13) appear to him.

between men and women).¹² The appearance of the unicorn in the Germanic inventory, instead of the dragon of Homeric and Old Armenian traditions, is due to the relatively recent influence of literary versions of the medieval European bestiary, in which the unicorn ultimately goes back in literary tradition to the Indic animal epic (see White 1954).¹³

On the whole the genre of animal dreams, found in medieval Germanic myth and evidently extending from this source into medieval European epics, reflects the traces of pagan beliefs (Beck 1965:144-46, q.v. for the same genre in Old Icelandic literature), and hence its similarities to the other Indo-European traditions point to the great antiquity of these beliefs and the associated realia.¹⁴

2.1.3.6. *The leopard or panther and the terms for it in Indo-European*

The leopard or panther can be posited as a real animal in the ecological environment of the Proto-Indo-Europeans, though its semanteme was subsequently lost in a number of later traditions. However, despite the fact that the existence

12. Motifs from the genre of animal dreams could have entered the medieval epic tradition, including Romance, from Germanic; this is found where authors of epics preserved connections to Germanic tradition, e.g. in the Song of Roland (see Rajna 1884:449ff., Tavernier 1910:93ff., Beck 1965:139-44):

El destre braz li morst un vers si mals.

Devers Ardene vit venir uns leuparz,

Sun cors demenie mult fierement asalt

'A boar bit his right arm so hard.

From the direction of the Ardennes he saw a leopard approaching;

It attacks him fiercely'

(727-29; lions, wild boars, and other animals appear in similar dreams elsewhere in the Song of Roland). The same collection of animals — leopard, 'light and nimble, covered with a spotted skin', lion, and wolf — appears in visions to the author of the Divine Comedy (cf. Botticelli's famous drawing):

Ed ecco, quasi al cominciar dell'erta,

Una lonza leggiere e presta molto,

Che di pel maculato era coperta... (I.31-33)

Si ch' a bene sperar m'era cagione

Di quella fera alla gaietta pelle (I.41-42)

'And there, almost at the beginning of the steep mountain slope,

Covered with a spotted skin, turning around,

Comes a panther, light and nimble...

It seemed to me that I would have good luck

And the marvelous fur of the animal...'

13. A vision including a leopard (Welsh *llewpart*), wild boar, and lion is also found in medieval Celtic tradition; for Welsh see Griffiths 1937:198.

14. This literary-mythological genre of dreams may well reflect a set of symbols going back to some prehistoric past. This is a sort of recollection of past history, removed to the collective unconscious and emerging in dreams (see the notion of 'genre memory', Bakhtin 1963:142; for the complex of werewolf associations see Jakobson 1966a).

of a semantic element 'leopard' or 'panther' is highly plausible, there is no conclusive evidence of protoforms reflecting it. There are two roots, neither derivable from the other by regular Indo-European rules: one in *-s- (Hitt. *parš-*, Pers. *pārs* ~ *fārs*) and one in *-d- (Gk. *pard-*, *pord-*, Sogd. *pwrδ-*, Skt. *prḍ-*). Borrowing of either of these forms from one Indo-European dialect into another is also ruled out. The word is regarded as a loan from a substratal language of Asia Minor (Kronasser 1962:I.183, Furnée 1972:64, 252, 277).

2.1.3.7. *The connection of the Indo-European word for 'leopard' with words from ancient Asia Minor*

In Hattic we find the word *ḫapraššun* as an equivalent to the Hittite genitive ŠA UG.TUR 'of leopard'. A prefix *ḫa-* and suffix *-un* can be segmented off,¹⁵ leaving a root *-prašš-*, which coincides with the root of Hittite *paršana-*.



Illustration 3.
Depiction of a dancing man in a leopard skin.
Çatal Hüyük, 7th–6th millennia B.C.

Hittite leopard worship, attested in a mythological Hittite text about the construction of temples for the Thundergod (412/b+2121/c+2030/c), continues

15. Cf. Hatt. *ḫa-p/wiwuna-n* 'among people' = Hitt. *dandukešni* 'among mortals'; *ḫa-wa-šḫap(-i)* 'among the gods' = Hitt. DINGIRMEŠ-*naš-a ištarna* 'among the gods', Kammenhuber 1969:490; *ḫa-i-waiḫ* 'in our house', Schuster 1974:96-97. For the suffix *-un* cf. *takeḫaun* 'lion' (Hitt. ŠA UR.MAH) beside *takeḫa* 'lion', *takkeḫal* 'hero' (Kammenhuber 1969:447, 467).

a tradition going back for millennia in this region. Excavations of the last decades have shown a leopard cult to have been a basic feature of the ancient culture of Asia Minor, going back at least to the seventh and sixth millennia B.C.¹⁶ This is the date given to the ruins of temples excavated in Çatal Hüyük, where frescoes have been found depicting leopards and dancing warriors in leopard skins, as well as sculptures of sacred leopards on which anthropomorphic deities could stand (Mellaart 1965:94, 1967, Strika 1975).¹⁷ Leopards as female symbols, or association of leopard images with female deities, are conspicuously frequent (throughout Asia Minor, not only in Çatal Hüyük but also at Hacilar: Masson 1966:163). This ancient cult may have entered the Proto-Indo-European culture area from Asia Minor, to be reflected in various archaic Indo-European cultural traditions.

The Indo-European word for 'leopard' may itself go back to a source from Asia Minor, which yielded different reflexes in the various Indo-European dialects. The alternation of *s and *d reflected in the Indo-European forms may point to a dental fricative in the original source language.

2.1.3.8. *Replacements of the word for 'leopard' in early Indo-European dialects*

A number of Indo-European dialects replace the original Indo-European word with other forms, or lose it entirely (e.g. Italic, Celtic, Baltic) as a result of new ecological and cultural conditions.¹⁸ For example, in the Kafir languages the leopard is referred to as 'killer': Waigali *jūṭ* 'leopard', cognate to Skt. *hantār* 'murderer, killer' (Morgenstierne 1954:162, 262; Fussman 1972:II.208), Kati *jut* 'leopard' (Grjunberg 1980:133-35). In Armenian, the semanteme 'leopard' is preserved but is expressed by *inj*, originally 'lion' (cf. the cognate Skt. *simha*-; see Meillet 1936:142); this may point to a taboo on the ritually significant word for 'leopard' in the prehistoric Armenian tradition.

16. The leopard cult of antiquity indicates that the leopard ranged in Asia Minor, as is confirmed by bones found in Çatal Hüyük (Masson 1966:165). The range of the leopard in ancient Southwest Asia was limited to mountainous regions, from Asia Minor and the Transcaucasus to southern Turkmenia (the Karatepe region, see Lisicyna 1978:198-200). A word meaning 'leopard' can also be reconstructed for Proto-Semitic: **nimr*- (Fronzaroli 1968:V.281).

17. An analogous leopard cult is found later in Egypt; leopard pelts were the clothing of priests and cloaks for especially solemn ceremonies (see Erman and Grapow 1955:I.415).

18. In the Slavic languages, as in the others just mentioned, there is no clear evidence for a word meaning 'leopard' or 'panther' at any early time (the Turkic loan *bars* is attested for Russian no earlier than the sixteenth century: Barxudarov 1975:I.74). Nonetheless, the extremely archaic phrase *ljutyi zvēr* 'fierce beast', which goes back to Common Slavic, could also refer to a leopard in Old Russian: cf. *Ljutyi zvēr skočil mne na bedry* 'The fierce beast jumped onto my thighs' in the *Admonition* of Vladimir Monomax. Later the phrase is used in reference to mythological animals: lion, bear, wolf, and lynx (Ivanov and Toporov 1974:58-61, 124, 171, 203-4).

2.1.3.9. The typology of the leopard cult in Southwest Asia

The leopard cult originating in ancient Asia Minor goes back to a remote past and covers a broad territory in the eastern Mediterranean area and western Asia. An echo of this cult in the Caucasian world is the image of the hero in a leopard's skin in the epic poem of medieval Georgia, Shota Rustaveli's *Vep-xistq'aosani*. The image bears a striking resemblance to the appearance of the Homeric warrior heroes Menelaus and Alexander wearing leopard skins on their shoulders, and the earlier images from Asia Minor of people wearing leopard skins and dancing like leopards.¹⁹

2.1.4. Lion

2.1.4.1. The question of the term for 'lion' in historical Indo-European dialects

Words for 'lion' show a variety of stems in early Indo-European dialects. Greek has two forms: *léōn*, gen. *léontos* (borrowed into Latin as *leō*, gen. *leōnis*) and poetic *līś* (in Homer, *Iliad* 11.239, 480). Mycenaean Greek attests *re-wo-pi* (Morpurgo 1963:294) and the adjective *re-wo-te-jo* (Risch 1976:313), which shows that Gk. *léōn* goes back at least to the Mycenaean period and has the form **lewont-* (Lejeune 1958:165). The other Greek form *līś* is evidently not cognate to **lewont-* and comes from another stem. Indic and Armenian point to still another root: Skt. *simha-* 'lion', Arm. *inj* 'leopard', from **singho-*.

In Germanic, 'lion' is expressed by such forms as OHG *lewo*, MHG *lewe*, *louwe* (Ger. *Lōwe*, poetic *Leu*, with a distribution analogous to that of Gk. *léōn*: poet. *līś*), usually considered a loan from Latin (Paul 1953:33, 41, 1956:I.382). But the derivation of the Old High German form from Latin *leō* is unconvincing because the Latin form, like its classical Greek source, lacks the intervocalic *-w-* lost in Greek dialects in the sixth to fifth centuries B.C. The Old High German *-w-* cannot be a secondary development, since there are no convincing examples of such a process; and there are examples showing preservation of intervocalic **-w-* in Common Germanic words: OHG *ēwa* 'eternity; eternal order', MHG *ēwe* 'law; eternity' (cf. Goth. *aiws* 'eternal'). This could be taken as evidence for the native status of Germanic (OHG) *lewo*. The parallel form, Ger. *Leu*, is noteworthy in this connection; usually traced to MHG *lōuwe*, late OHG *louwo*

19. Therefore the correct interpretation of OGeo. *vepxi* would seem to be 'leopard' (cf. Marr 1910), not 'tiger' (the word acquires this meaning in Modern Georgian; cf. the semantic evolution from 'leopard' to 'tiger' in East Asian languages): see Caišvili 1974[1965]:270-76, Kobidze 1969:II.78ff. It is obviously a leopard that is depicted in an ancient bronze belt from a grave in Samtavro (belt 3, Table III) which shows spotted 'fantastic animals' (Xidašeli 1982:29).

(Paul 1953:41, 1956:I.382), it is completely parallel in its development to Ger. *treu* 'true' (masc.), which reflects Proto-Germanic **triuwaz* (Paul 1956:II.626, Watkins 1971:1512), cf. Goth. *triggws*, OIcel. *tryggr* 'solid, sound; true', OE *-trēowe*, Engl. *true*, from PIE **t'reu-os*, cf. OIr. *dron* 'solid, sound' (for the semantics see Benveniste 1966a:299, 1969:I.108). This is grounds for positing Proto-Germanic **liuwaz* < PIE **leu-os*.²⁰

Hittite has a word for 'lion', *walwa-* (Luw. *walwa-*), as well as *walwi-*, a reading of the Sumerogram UR.MAḪ-*aš* and UR.MAḪ-*iš* (see Neu 1974:103 and references therein),²¹ which confirms the Proto-Indo-European character of the root **leu-* 'lion'. The Hittite word is a broken reduplication **wolw-o-*, with the second root sonant repeated.

2.1.4.2. The cultic role of the lion in early Indo-European traditions

The presence of Anatolian, Greek, and Germanic cognates for 'lion' and the consequent Proto-Indo-European nature of the word are in agreement with the exceptional cultic role of lions in various Indo-European traditions. In the Hittite tradition, in addition to the evidence presented above for joint veneration of leopards and lions, there is a relevant motif of ritual capture of a wolf and a lion by mythic beings: UR.BAR.RA *ki-iš-šar-ta e-ep-ten* UR.MAḪ *ga-nu-ut e-ep-ten* (KUB XII 63 I 26) 'seize the wolf by his paws, and the lion by his jaws' (translation taken from Watkins 1972a). In Hittite and Luwian art the lion is one of the basic motifs: lion images are found at Malatya, Alaca Hüyük, and elsewhere, and the Lion Gate at Boghazköy depicts the lion as a symbol of the king's power among the Hittites.²²

The same tradition is reflected in Mycenaean Greece. Lionesses on both sides of the throne at Pylos and lions over the gates at Mycenae symbolize the sacred power of kings and are an exact repetition of the same motifs in contem-

20. The Proto-Germanic form could conceivably have preserved the *e* vocalism that reflects earlier Indo-European **e*. In Old High German there are instances where short *e* is preserved before *u* (Paul 1953:42-43). If we reconstruct **liuwa-* with **i* vocalism for Proto-Germanic we can regularly derive early Slavic **lŭwŭ* from it as a loan: OCS *lŭwŭ* 'lĕōn' (see Vasmer 1964-1973:II.471-72).

21. Neumann's reading (1961) of Hitt. *awiti-* as 'lion' (from **owi-et-* 'devourer of sheep') raises both formal and distributional objections: the initial *h-* expected on the basis of Luw. *ḫawi-*, Hier. Luw. *hawali-* 'sheep' is missing (Kammenhuber 1961b:199); and *awiti-* is used, not in place of the Sumerogram UR.MAḪ, but next to it (Friedrich 1966:12).

22. Cf. the royal ritual where 'eagle's eyes' and 'lion's teeth' are made for the king: *šakuwa-šši ÁMUŠEN-aš ier KAxUDḪA-ma-šši* UR.MAḪ-*aš ier* 'they made eagle's eyes for him, and they made him lion's teeth' (KUB XXIX 1 II 53; later the same passage mentions lion's teeth and leopard's teeth). Cf. also in Old Hittite texts UR.MAḪ LUGAL-*uš* 'lion king (hero)' and similar expressions (Neu 1974:103).

poraneous Hittite art (Webster 1958:32, 57-58 et pass.). A goddess interpreted as the mistress of wild animals, Artemis,²³ is depicted in Mycenaean art with a lion at each side. (This recalls the leopards at each side of the fertility goddess in the art of ancient Asia Minor; the two leopards on the handle of a dagger in the traditions of ancient Asia Minor [Mellaart 1965] correspond to the two symmetrical lion heads on the handle of a sword from a Mycenaean grave [Blavatskaja 1966:53 and fig. 17].) Hittite and Mycenaean art also share similar scenes of lion hunts (a blade from Mycenae, Blavatskaja 1966:59-60 and fig. 13). In describing objects decorated with images of lions, Mycenaean tablets use the word discussed earlier, *rewopi* 'with lions' (Lejeune 1958:181). Given the absence, or at least great rarity, of lions in the historical territory of the Greeks, the significance of lions as a cult animal and artistic motif can be explained as the continuation of a tradition which arose in a different ecological environment.

The motif of a lion as a sacred animal is preserved into the Homeric epoch, with echoes in the classical tradition reflected in the image of Hercules, who fought a lion and wore a lion skin.²⁴ The image of lions and lion gates continues into later Greek tradition in the form of palace gates in Greek tragedy (Hiller 1976).

In the Germanic tradition, shields depicting a wild boar and lion, or a lion and lioness, are known among the eastern Germans as early as the fourth century A.D.; cf. the evidence of lions as symbols on battle shields in Old Icelandic sagas and lions on the banners of Anglo-Saxon kings (Beck 1965:35-37ff.), and the data cited in II.1.4.4 above showing lions to have been among the sacred animals of the Germanic tribes.

Later ramifications of what is ultimately the same Indo-European cult of the lion as a sacred animal and 'king of beasts', with overlays from classical and Christian times, can be seen in the literature and folklore of the Celts²⁵ and Slavs.²⁶

23. Compare Homer's use of *léōn* in reference to Artemis: *Zeús se léonta gunaiksì thēke* 'Zeus placed you before women as a destroying lioness'.

24. Herakles, shown fighting with a lion on Attic vases, is shown in a lion's mouth in one instance (Webster 1958:175-76 and fig. 24), which may echo the Hittite mythic text discussed above which mentions catching a lion by its jaws.

25. Starting with the twelfth century, in Welsh tradition the heroes who free the country from the foreign domination of the Anglo-Saxons were depicted as lions, dragons, bears, eagles, bulls, wolves, donkeys, and dogs (Griffiths 1937:167ff.).

26. In Slavic tales, folk songs, incantations, and rituals the lion is given the place of honor as king of the animals; and in East Slavic folklore *lev-zver'* 'lion beast' often figures as a parallel to the phrase *ljutyj zver'* 'fierce beast' (see Ivanov and Toporov 1974:60). In the first element of this phrase Miller (1877) sees a cognate to Gk. *léōn* (from **leu-*). In that case, Common Slavic *ljutŭ* < **leuth-*, which has so far not been etymologized satisfactorily, can be regarded as a derivative in **-th-* from the same root **leu-* 'lion'; cf. the similar formation in Alb. *letë* < **leut-* 'mane'.

2.1.4.3. The relation of the Common Indo-European word for 'lion' to Afroasiatic and other Southwest Asian terms

The Hittite, Greek, and Germanic cognates, and the possible cognate derivatives in Slavic and Albanian, point to an Indo-European lexeme ***leu-** 'lion'. It goes back to Proto-Indo-European times and was subsequently replaced or lost in various dialects due to changed ecological conditions.²⁷ These conclusions make it plausible to connect Tocharian A *lu* 'beast, animal' (gen.sg. *lw-es*, nom.pl. *lw-ā*, instr.pl. *lwā-yo*, loc. *lwā-k-am*) to the same Indo-European root; the semantic generalization would have taken place when Toch. A *śišäk*, B *şecake* 'lion' was borrowed, probably from Indo-Iranian (cf. Skt. *śimha*-).

PIE ***leu-** 'lion' is phonetically very close to words for 'lion' in Afroasiatic languages, e.g. Egypt. *rw* 'lion' (the attestation begins with the Pyramid texts: Erman and Grapow 1955:II.403), Copt. *laboi*, Akkad. *lābu*, Ugaritic *lb*', Hebr. *lābī*' beside Arabic *labwa* (Koehler 1939),²⁸ Kartvelian ***lom-** (Geo. *lom-i*, Svan *löm*) is also relevant. The word was obviously an early Near Eastern migratory term for the lion,²⁹ which throughout ancient Southwest Asia symbolized animal power and the holy power of the king. The term must have entered the archaic Indo-European dialects before the Proto-Indo-European breakup, since it yields regular reflexes in them. In this respect the word for 'lion' is analogous to the word for 'leopard', another Near Eastern migratory term found in a number of languages of the area.

2.1.4.4. Traces of an Indo-European word for 'lion's roar'

If there was a Proto-Indo-European word for 'lion', it is likely that there was also a word for its roaring, one of its most salient features; and in fact a number of dialects reflect just such a word: Lat. *rugiō* 'roar like a lion', Mlr. *rucht* 'roaring, howling', Hom. Gk. *ereúgomai* 'roar; growl, snarl' (used figuratively, of a hero, Iliad 17.265; of the sea, Odyssey 5.403; and also, in the meaning 'roar, bellow', of a bull: *taūron erúgmēlon* 'roaring bull', Iliad 18.580); OCS

27. Although Indo-Iranian uses a different lexeme to mean 'lion', the significance of the animal remains considerable, as is seen in the Rgveda: see the reference to a lion in the hymn to Parjanya (V, 83, 3), where the Thundergod's thunder is compared to the 'thunder roar of a lion', *śinhāsya stanātha-*; the dialogue hymn of Indra (X, 28, 1), where the lion figures as the highest animal, contrasted to the fox; and elsewhere.

28. The other form for 'lion', shown by Gk. *līś*, can be compared to *lāīš*, attested in Hebrew and representing a parallel form to the root *lb*' (Masson 1967:85-87), which is reconstructible for Proto-Semitic as ***labī** 'lioness' (see Fronzaroli 1968:V.281).

29. Despite the wide distribution of forms with the phonetic structure *liquid + labial* referring to lions, we find a word of completely different structure in Hattic: *takeḫa-un*, corresponding to the Hittite Sumerogram ŠA UR.MAḪ 'lion' (Kammenhuber 1969:447, 467). It is significant that the word for 'hero' is derived from this word: *takkeḫal*.

rŭžq ‘neigh’, ORuss. *r’žati* ‘neigh, cry, roar’ (e.g. in the chronicle *vzorža zemlja* ‘the earth began to roar’), Goth. *in-raúhtjan* ‘become furious’: PIE **reuḱ’-*. Names of animals naturally develop from this original meaning: Arm. *aṛiwc* ‘lion’ (Ačarjan 1971:I.259), OIcel. *raukn* ‘harness animal’; for the semantic development of OE *rēoc* ‘wild’ cf. Russ. *ljutyj zver’* ‘fierce beast’ (a folkloric phrase, discussed in 2.1.5.2 below; see also note 18) from the root for ‘lion’.

In addition to **reuḱ’-*, there was a parallel stem **reukh-* with the same meaning: OHG *rohōn* ‘*rugīre*’, ‘growl’, Lith. *rŭkti* ‘growl’, OCS *rykati* ‘roar’, Russ. *ryk* ‘(lion’s) roar’. These two share a root **reu-* ‘roar’, attested in Skt. *ru-* ‘roar (of bulls)’, *rāva-* ‘roaring, thunder’, OCS *rovq* ‘roar’, etc.

2.1.4.5. The typology of the lion cult in the Near East

The ritual significance of lions in the Caucasus, particularly in ancient Kartvelian tradition, may be an echo of the Near Eastern lion cult. In western Georgia sculptures of lions have been found, dated to the first millennium B.C. and reminiscent of the Hittite and Mycenaean depictions of lions. There are Svan lion banners (Bardavelidze 1957:37ff.) and a Khevsurian prayer to a god Lomisi, obviously ‘lion god’ (cf. Geo. *lom-i* ‘lion’): Charachidzé 1968:211, 442-44 et pass. A literary reflection can be seen in the presentation of the hero ‘in the form of a lion’ and the symbolic conjunction of leopard and lion in Rustaveli (see Marr 1910).

2.1.5. Lynx

2.1.5.1. The word for ‘lynx’ in the Indo-European dialects

A word for ‘lynx’ is found in almost all of the main Indo-European dialect groups: Gk. *lŭgks*, gen. *lugkós*, OHG *luhs*, OE *lox* ‘lynx’, Arm. *lusanunk’* (pl.), Lith. *lŭšis*, OLith. *lŭš-ų* (consonant stem: Būga 1958-1961:II.59, 549) ‘lynx’, Latv. *lūsis*, OPruss. *luysis*; formal divergences are shown by Slavic **rysŭ* (Russ. *rys’*), with *r-* instead of **l-*, and Celtic (MÍr. *lug*, gen. *loga*), with *-g-* instead of **-k-*. The phonetic alternations can be ascribed to the fact that this is an animal name; also relevant is the nasalization in Greek, *lun-k-*, paralleled by Lith. dial. *lŭnšis* (Būga 1958-1961:II.549).

This word is clearly etymologically related to the root PIE **leukh-* ~ **lukh-* ‘shine’ (cf. Skt. *rúśant-* ‘light-colored, white’). The animal was named for the light or bright color of its coat or eyes. Compare, from recent traditions, Latv. *lŭša spalvas zirgs* ‘lynx-colored horse’.

2.1.5.2. The status of the lynx in Indo-European mythic and ritual traditions

The lynx is of minimal mythological and ritual significance in most ancient Indo-European traditions. In northern traditions the lynx is a functional replacement for the large predators not found in those regions. In East Slavic burial rites for kings, the role of the leopard in other Indo-European traditions is taken over by the lynx (in a sacrifice of lynx or bear claws); in East Slavic folklore the epithet *ljutyj zver'* refers to lions, leopards, or lynxes (Ivanov and Toporov 1974:59). In Lithuanian, the word for 'lynx' can also be applied to tigers and leopards (Būga 1958-1961:II.549); semantic shifting is possible in Mlr. *lug* 'lynx'; Latvian folk songs glorify lynx pelts (*lūšu kažuociņi*).

The fact that there is no trace of a cultic role for the lynx or wildcat in ancient Indo-European traditions, while the animal is widespread and its name can be reconstructed and is preserved in the original sense in many branches, can be explained only by properties of the structural hierarchy of wild animals in the system of early Indo-European mythic conceptions. In cultures where the large felines such as the leopard, lion, and tiger occupy important positions in the hierarchy, as they do in the oldest Indo-European traditions, the smaller animals like the lynx have no place in the system. They acquire ritual function only in the traditions which, for one reason or another, have lost the larger felines, whose place is then taken by the smaller ones, as happens in the less ancient Baltic and Slavic traditions.

2.1.6. Jackal, fox

2.1.6.1. The Indo-European term for 'jackal', 'fox' and its original meaning

The small carnivores in early Indo-European tradition also include the jackal and fox, whose names in the daughter languages partly match the word for 'wolf', ***w₁lph-**: Avest. *urupi-* 'dog', *raopi-* 'fox, jackal', Lat. *uolpēs* 'fox', Lith. *lāpė* (from **wlopē*) 'vixen'. These forms clearly show a phonetic-morphological variant of a stem that has been formed from ***w₁lph-** by addition of *-i-* (Avestan) or *-e-* (feminine; Latin and Lithuanian). The use of a stem with the basic meaning 'wolf' to refer to jackals or foxes shows that, in the Indo-European taxonomy, these animals were classified together, presumably on the basis of their similar appearance and eating habits.³⁰

The same set of animals has another name in Indo-European dialects, coinciding only in part with the first one: Skt. *lopāśá-* (< **laupāśa-*) 'jackal, fox',

30. Many languages exhibit a typological parallel to the formal correspondence of 'wolf' to 'jackal' and 'fox', or more precisely to the use of the word for 'wolf' to refer to foxes and jackals. For instance, in Abkhaz *a-bga* 'wolf' also denotes foxes and jackals.

Waigali *liw'ašā*, *lāwāšā* 'fox', *lawāša* 'jackal' (Morgenstierne 1954:274), OPers. *Raubasa* (personal name in Elamite transmission, Mayrhofer 1973:226), Pehl. *rōpāh*, Pers. *rōbāh*, Khotanese Saka *rruvāsa-*, Ishkashim *urvēs*, *urvēsok*, Sanglechi *vārvēs*, *wārvēs* (Abaev 1958-1979:II.433-34), Arm. *atūēs* (from **alophes-*) 'fox', Gk. *alōpēks* 'fox', Lith. *vilpišys* 'wildcat', Latv. *lapsa* 'fox', OCS *lisa* 'fox' (translating Gk. *alōpēks*); see Pokorny 1959:1179. All these forms can be derived from **wlophekh-ā*, which is a feminine formed by compounding: **wl-o-phekhw-(ā)*. The first root is the zero grade of **wel-* 'tear apart prey; kill' (also 'dead; world of the dead'), the source of **wlkho-*, **wlph-* 'wolf' and **wlph-i/-ē* 'jackal, fox'. The second root is **phekhu-* 'livestock'; hence the original meaning was 'cattle killer' (or 'one who feeds on dead cattle').³¹ The protoform **wl-o-phekh-(ā)* can produce all attested forms with minimal phonetic adjustments: loss or metathesis of the initial **w-*, a prothetic vowel in some forms (Greek, Armenian), and later reduction of the root vowels. These phonetic alterations could have taken place as the compound, which could originally refer to any predator on livestock, lost its descriptive meaning and was reinterpreted as an unanalyzable word for a particular animal, primarily the fox and jackal.³²

2.1.6.2. The role of the jackal and fox in ancient Indo-European tradition

In early Indo-European tradition the jackal and fox are unattractive, low-ranked animals in contrast to the large carnivores such as the lion, panther, and leopard, which symbolize exaltation, greatness, and beauty (including that of a female deity). The jackal and fox are distinguished among animals only by their cunning and craftiness, and are usually feminine. In the Rigveda, the only reference to them is in a context where they are contrasted to high-ranked animals (X, 28, 4):

idām sú me jaritar ā cikiddhi pratīpām śāpām nadyò vahanti

lopāśāḥ simhām pratyāñcam atsāḥ kroṣṭā varāhām nír atakta kákṣāt

'Understand this word of mine to the end, singer: the rivers drive driftwood against the current;

The fox (*lopāśā-*) has crept up on the lion (*simhām*) from behind,
the jackal (*kroṣṭā*) has ambushed the wild boar (*varāhām*)'

31. For the loss of **w-* in this position (**wl-o-phekhw-ā* > **wl-o-phekh-ā*) cf. **wīr-o-phkhw-o-* > **wīr-o-phkh-o-* in Ved. *virapśā-* 'multitude of people and animals', Iran. *Wrps̥*.

32. In a number of dialects, including Germanic, this word in the meaning 'fox' is also replaced (due to taboo?) by another root: Goth. *faúhō*, Olcel. *fóa* 'fox'; with the masculine ending -s, OHG *fuhs* 'fox' (Ger. *Fuchs*), OE, Engl. *fox*.

Fables opposing a crafty fox to a lion or leopard are among the most widespread in antiquity.³³ These motifs are characteristic of a folk animal epos widespread in the folklore of Eurasian peoples and given literary embodiment in Goethe's *Reineke Fuchs*.

2.1.7. Wild boar

2.1.7.1. The Indo-European term for 'wild boar' and its transformations in the historical dialects

The wild boar in early Indo-European tradition is comparable in its cultic significance to the large predators discussed earlier — the wolf, bear, leopard, and lion. The original Indo-European word for 'wild boar' is preserved in only a few dialects, primarily Italic: Lat. *aper* 'wild boar', *aprunus* 'of or pertaining to wild boars' (lit. 'created by wild boar'), Umbr. *abrunu* (acc.sg.) 'wild boar'; also Germanic: OE *eofor* 'wild boar', OHG *ebur* (Ger. *Eber*). The Baltic and Slavic cognates have initial *w-: Latv. *vepris* 'wild pig; hog', ORuss. *vepr*' (often *divii vepr*', with *divii* 'wild':³⁴ Sreznevskij 1958:I.245).

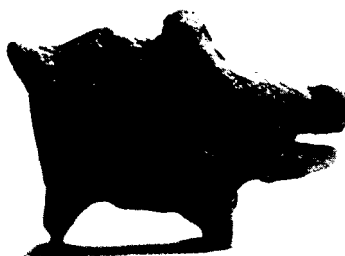


Illustration 4.

Clay figurine of a (wild) boar. Northern Black Sea area,
second half of 5th millennium B.C.

The stem of these words can be related to one meaning 'throw', 'ejaculate (semen)': Skt. *vāpati* 'ejaculates', *vāpra-* 'embankment (of earth)' (see Pokorny 1959:1149). The connection is plausible in view of ancient conceptions of this animal as first of all a breeder, well reflected in mythological tradition (especially Germanic) as discussed below.

33. Cf. Aesop's fables of the fox and lion and the lion and leopard, where the spotted (*poikīlos*) skin of the leopard is set off against the spotted (i.e. extremely crafty) soul of the fox.

34. Cf. in the Rigveda (I, 114, 5) *divó varāhám* 'heavenly boar' (concerning the god Rudra), where the first element is cognate to the first element of the Slavic expression.

Another base, semantically connected with the Sanskrit verb, is probably represented in Skt. *káp-ṛ-th(-a-)* 'penis', related to Gk. *kápros* 'wild boar', Lat. *caper* 'goat', Umbr. *kaprum* 'caprum', OIcel. *hafr* 'goat', OE *hæfer* 'goat' (see Ernout and Meillet 1967:38). This set can be seen as cognate to the set meaning 'wild boar' (Lat. *aper*, ORuss. *vepr*', etc.) if we reconstruct an archaic Proto-Indo-European root with initial postvelar **qʰ-*: **qʰwepʰ-*, with loss of the **qʰ-* in some dialects (Skt. *vápati*, ORuss. *vepr*', Latv. *vepris*, OHG *ebur*, Lat. *aper*) and merger with **kʰ-* in others (Skt. *káp-ṛ-th-*, Lat. *caper*, Gk. *kápros*; for postvelar **qʰ* and its reflexes see I.2.4.6 above).³⁵

In some dialects, particularly Italic and Germanic, these phonetic processes produced doublets which underwent subsequent semantic differentiation, with one form preserving the meaning 'wild boar' (Lat. *aper*, OE *eofor*, etc.) and the other coming to mean 'he-goat, breeding male goat' (Lat. *caper*, OE *hæfer*, etc.). Homeric Greek preserves the original meaning of the form with initial *k-*, *kápros* 'wild boar', also used in the combination *sūs kápros* 'wild boar' (Iliad 5.783 et pass.).

It is apparently the cultic significance of the wild boar that explains the tendency to replace the original word for it with one meaning '(domestic) pig': *sūs*, *hūs*. As early as Homer we find, beside *kápros* 'wild boar' (Odyssey 6.104), combinations like *sūs kápros* (Iliad 5.783, 17.21) 'wild-boar pig', *suōn kápros* (Odyssey 11.131) 'pig boar' or simply *mégas sūs* 'large pig' meaning 'wild boar' (Odyssey 4.457, 19.439).

2.1.7.2. *The cultic significance of wild boars in ancient Indo-European traditions*

In Hittite tradition the wild boar — whose Hittite name is unknown, hidden behind the Sumerograms ŠAḪ 'pig, wild boar' and ŠAḪ.GIŠ.GI 'wild boar' (lit. 'reed pig') — is mentioned in a series of sacred animals (*šīunaš hūitar* 'god's animals') for a menagerie, following the lion (UR.MAḪ) and preceding the bear (AZ) in the Old Hittite Anittas text (see II.1.4.3 above). The animal has the same significance in Mycenaean Greek tradition, where we find the earliest evidence of warriors' helmets with wild boar tusks as a symbol of warlike

35. As a result of the merger of **qʰ* and **kʰ* in the early Indo-European dialects, the sequence **kʰw-* arises in these forms; in the *centum* dialects this sequence is kept distinct from the labiovelar **kʰw-* and simplified to **kʰ-*: Gk. *kápros* 'boar', Lat. *caper* 'he-goat'; for the details of this phonetic process see I.2.3.2 above. The sequence of initial postvelar plus labial **qʰw-* posited for archaic Indo-European, which yields **kw-* in a number of dialects, can probably explain the anomalous correspondences of root vocalism in various dialects (Lat. *aper*, *caper*, Gk. *kápros* beside OE *eofor*, Russ. *vepr*', Latv. *vepris*) as well as the voiced *g-* of Celtic (OIr. *gabor*, Welsh *gafr* 'goat'; see Pokorny 1959:529), which may be a peculiar reflex of **kʰw-*.

qualities. Exactly such a helmet, with 'the silver-toothed boar's white tusks', is described in Homer's *leukoî odóntes argiódontos huós* (Iliad 10.263-64).

Boar-tusk helmets and shields, and military emblems with depictions of wild boars as a warlike symbol, are widespread among the ancient Germans, for whom the cultic significance of the wild boar is equivalent to that of the wolf and bear. In *Beowulf* there are frequent descriptions of a war helmet depicting a wild boar: *eofor-līc* 'boarlike' (303), *swīn-līc* in the same meaning (1453), *eofor* meaning 'image of a boar on a helmet' (1328), *eofor hēafod-segn* 'boar's-head helmet' (2152).

In Old Icelandic, the ancient word for 'wild boar', *jǫfurr*, is used only in the meaning 'prince' (also 'god'), a usage which symbolizes this animal's special status in Germanic tradition. The wild boar was also a totemic animal to Germanic tribes, who traced their lineage to a pair of divine brothers, Ibor and Agio; the name of the first is cognate to the Indo-European words for 'wild boar'. Because of the special cultic significance of the wild boar in Germanic tradition, the name for it is tabooed in its original meaning and replaced by other words, especially words meaning 'domestic pig', a semantic development comparable to that of Greek.

An important aspect of the boar cult in Germanic tradition is its connection with plant and animal fertility, shown by passages in a number of literary and legal texts and by archeological findings showing that the boar was a sacrificial animal and considered the food of gods and heroes (Beck 1965:56-69 et pass.). This further reflects an Indo-European view of the boar as a mythological breeder, the very trait captured in its original Indo-European name.

Early Celtic tradition is characterized by various depictions of boars as cult symbols: sculptures (especially the three bronze boars from Neuvy-en-Sullias), images on shields and military banners, on Gaulish coins, etc. In Old Irish the word for 'wild boar' (OIr. *torc*) also meant 'prince' as in Germanic (the original Indo-European word for the animal had evidently already been tabooed). Welsh tradition preserves a tale about the king Twrch Trwyth (*twrch* 'wild boar'), who was divinely turned into a boar (Beck 1965:116-17); cf. the Homeric passage discussed above in 2.1.3.3 where a god turns into a boar.

The ancient pagan traditions of the Baltic Slavs preserved a conception of a huge mythic wild boar which, flashing its white tusks, appeared out of the sea every time that the sacred city Retra was threatened by misfortune (Ivanov and Toporov 1965:37-38, 116, 134-35).

The concordant evidence from various Indo-European traditions on the significance of the wild boar, together with the cognate words in various dialects, permit us to trace the entire complex of ritual conceptions, together with the name of the animal, back to Proto-Indo-European.

2.1.8. Deer, European elk, and antelope

2.1.8.1. The Proto-Indo-European term

We may reconstruct a term for these animals, with various suffixes and a common root **el-*, **ol-* which may originally have meant 'brown, red': cf. Toch. A *yāl* 'antelope', *ylem* 'of or pertaining to an antelope'.

PIE **(e)l-ḱh-*: Skt. *ṛśya-* (in the Rigveda, which also has *ṛśya-dá-* 'trap or pitfall for antelope'), *ṛśa-* 'male antelope', Gk. *álkē* 'European elk', Lat. *alcē*, gen. *alcēs* id. [from Germanic], ORuss. *los'*, OHG *ēlho*, *ēlaho* (Ger. *Elch*), OE *eolh*, OIcel. *elgr* (the source of Engl. *elk*).

PIE **el-en-*, **el-ṇ-*: Gk. *ellós* 'fawn' (< **el-n-os*), *élapfos* 'deer; doe' (< **el-ṇ-bho-s*),³⁶ Myc. Gk. *e-ra-pi-ja* 'pertaining to a deer' (fem.) (Risch 1976:313), Arm. *ełn*, gen. *ełin* 'deer', OIr. *elit* 'doe' (< **el-ṇ-thī*), Lith. *ėlnis* 'deer', OPruss. *alne* 'male deer' (Toporov 1975:I.77), OCS *jelenŭ*, *alŭnŭjŭ* 'deer' (Russ. *olen* 'deer', *lan* 'doe').³⁷

The distribution of meanings and forms for 'deer', 'antelope', and 'European elk' makes it possible to distinguish two stem forms and their meanings. The first was the semantically marked stem **el-en-*, **el-ṇ-* (with extension **-en-/*-ṇ-*), originally meaning 'deer', and the second was **el-ḱh-* (with extension **-ḱh-*), meaning either 'European elk' or 'antelope', the meanings in complementary distribution by dialect. Toch. A *yāl* 'antelope' belongs to this group semantically, and may represent the bare root. Thus the second stem form has indeterminate original semantics, while the first one is unambiguously 'deer'. The precise Proto-Indo-European meaning of **el-ḱh-* — which may have been 'European elk', 'antelope', or 'brown antlered animal' in general, but was distinct from 'deer' — can be established only on the basis of broader information about the original territory of the Proto-Indo-European speakers.

2.1.8.2. The taboo on the original word for 'deer' and its mythological significance

Several Indo-European dialects taboo the word for 'deer' at a fairly early time, replacing it with other terms. In particular, in Iranian, where the deer has special cultic and ritual significance, the term is replaced by a new compound **gav-az-(na-)*, lit. 'bull-goat': Avest. *gavasna-* 'deer', Khotanese Saka *ggūysna-*,

36. The element **-bho-* in **el-ṇ-bho-* may be cognate to the analogous element of Skt. *ṛśabha-* 'bull', which is usually analyzed as root *vṛśa-* plus *-bha-* (Thumb and Hauschild 1959:II.44).

37. A possible connection of **olinā* 'elbow' with **el-ṇ-* 'deer' has been advanced; it assumes a metaphor 'horned bone' (Mastrelli 1976).

Sogd. *y'wzn-*, Pehl. *gawazn* (Abaev 1958-1979:II.320). Even this term is subsequently tabooed in Iranian, replaced by the euphemistic 'antlered one' (metaphorically, from 'branchy'), which also extends to the animal as a totem of the East Iranian Sakas (*sāka* 'Scythian'): Oss. *sag* 'deer' beside *sāka* 'branch, twig', Skt. *śākhā* 'branch', cf. Russ. *soxa* 'branch', *soxatyj* 'European elk', lit. 'branchy' (Abaev 1949:I.49, 179).



Illustration 5.
Fresco showing a deer hunt. Çatal Hüyük, 7th–6th millennia B.C.

In Old Icelandic tradition the deer is the basic mythic horned animal on the Cosmic Tree, where it reaches beyond the boundaries of the Middle World to the top of the tree; it was represented as a constellation, which is analogous to the conception of the European elk among northern peoples — the Lapps and the Greenland Eskimos (Dumézil 1959:105-6).³⁸ In the Edda the deer is called *hjqrtr*, a term different from the original Indo-European one and formed, like its early Germanic cognates OE *heorot* (Engl. *hart*) and OHG *hiruz* 'deer' (Ger. *Hirsch*), from a root meaning 'horn, antler; antlered animal' (cf. the same kind of replacement in Iranian and Slavic, above). Celtic also uses a secondary term based on 'antler': Bret. *karo*, Corn. *carow* 'deer' (from 'antlered': Porzig 1954:175 [1964:259]).

In another group of dialects, Albanian, Baltic, and Germanic, the ancient term for 'deer' is replaced by a different word: Alb. *bri* 'horn, antlers', Latv. *briēdis* 'European elk; deer', Swed. dial. *brind* 'European elk' (Porzig 1954:210 [1964:310]).

38. In some Slavic traditions the European elk acquires cultic and mythological significance, displacing the deer; it is represented as a constellation (Ivanov and Toporov 1974:49). This may be connected to the taboo replacement of the original East Slavic word for 'elk' by the descriptive *soxatyj* 'branchy (antlered)'.

2.1.9. Wild bull, aurochs, and bison

2.1.9.1. The Indo-European term for the wild bull and its connection to Semitic

A generic term for wild cattle and aurochs is attested in the main early dialects: Gk. *taūros* 'ox, bull', Lat. *taurus* id., Osc. *taurom*, Umbr. *turuf*, *toru* 'tauros', Lith. *taūras* 'aurochs', OCS *turŭ* 'bull', ORuss. *tur* 'aurochs', Alb. *tarok* (cf. also Gaul. *tarvos*, Mlr. *tarb* 'bull', OIcel. *þjórr* 'bull'): PIE **t^hauro-*. The same word can be seen in Semitic **tawr-* (Fronzaroli 1969:VI.304); this indicates an origin for the term in a Southwest Asian migratory word for this animal, which had an important cultic role in the ancient cultures of the eastern Mediterranean.³⁹ In this respect the word has much in common with the culturally significant Southwest Asian migratory terms for 'leopard' and 'lion', mentioned above.

2.1.9.2. The cultic role of the aurochs or wild bull in individual traditions

In some Indo-European traditions, particularly in Baltic and Slavic, which have preserved the word in its original meaning 'aurochs', this animal is connected to a whole complex of archaic rites and folklore motifs. A Russian *bylina* preserved in an early recording associates three animals of cultic significance: the aurochs, the *ljutyj zver'* (lit. 'fierce beast'), and the wild boar (Ivanov and Toporov 1974:170). In medieval Kiev there was a place named *Turova Božnica* 'aurochs altar' (Chronicle, sub anno 1146); in northern Russia there is an analogous name *Kapišče Turovo* 'aurochs temple'. Similar conclusions about the ritual significance of the aurochs can be drawn from Baltic folklore toponymics (Būga 1958-1961:II.634-36).

2.1.9.3. Derivatives from the term for 'wild bull' in Indo-European dialects and their Caucasian parallels

Derivatives probably formed from this root arise in individual early dialect groupings; they include forms with zero grade, secondary nasalization, and phonetic transformation of the initial part of the root.⁴⁰ With initial change

39. The bull is the second most significant cult animal after the leopard in ancient Southwest Asian culture of the seventh and sixth millennia B.C. as known from Çatal Hüyük (Mellaart 1967); this is also true of later Crete, as reflected in the legend of the Minotaur and perhaps Plato's myth of Atlantis.

40. If we admit such root-initial phonetic changes and root vowel changes, then we can relate this same root to the form **st^heuro-* attested by Av. *staora-* 'cattle', Goth. *stiur* 'bull', OIcel. *stjórr* 'bull', OE *stēor* (Engl. *steer*), OHG *stior* (Ger. *Stier*); cf. the same **e* vocalism in OIcel. *þjórr* from **t^heuro-*.

through prefixation of secondary *s-* the root appears in a number of dialects in the meaning 'European bison' (*Bos primigenius* Boj.): Lith. *stuõbras*, Latv. *stumbrs* and, with simplification of the initial cluster, *sumbrs* and its doublet *sũbrs*. As shown above, such phonetic transformations of culturally significant words are frequent among the names of animals. Related to these forms is OPruss. *wissambris* 'bison', from **wis-sambri-*, where *wis-* refers to musk and the similar strong-smelling substance characteristic of bison (Pokorny 1959:1134): cf. OIcel. *visundr* 'bison', OHG *wisunt* (Ger. *Wisent*). Another phonetic transformation of the initial consonant produces the Slavic word for 'bison': ORuss. *zubr*, Czech *zubr*, South Slavic **zq̃mbrũ* (the source of Rumanian *zimbru*, MGk. *zõmbros* 'bison').

A migratory term widespread in the Caucasus is probably related to this set of words: Oss. *dombaj* 'bison' (and also 'lion'), Kabard. *dombej*, Adyghe *dombaj*, Abkhaz *a-domp'èj*, Svan *dombäj*, Balkar *dommaj*, Karachay *dommaj*, and others (Abaev 1958:I.365). The link between Caucasian and Balto-Slavic is interesting in view of the range of the bison. Now nearly extinct, it formerly lived in the Caucasus uplands, where evidence for it goes back to the Stone Age (there are Mousterian camps with significant quantities of bison bones: Semenov 1968:289), and, up to medieval times, in eastern Europe — the historical territory of the Balts and Slavs (Calkin 1956:133, 138, 229, 1962:77, 1966:58-59, 101). The paleozoological facts help explain the origin of the Indo-European dialect terms. A distinctive species of animal, found in the territory of the Balts, Slavs, and eastern Iranians, was given a special designation formed by phonetic alteration of the inherited Proto-Indo-European term for 'wild bull'. As a result, Baltic and Slavic have doublet words, one regularly continuing the protoform and meaning 'aurochs' (OCS *turũ*, Lith. *taũras*), and the other, phonetically reshaped, meaning 'bison' (ORuss. *zubr*, Lith. *stuõbras*).

2.1.10. *Hare*

2.1.10.1. *The Indo-European word for 'hare' and its dialectal replacements*

The Proto-Indo-European term for 'hare' goes back to a root **k̑has-*, **k̑has-no-*: Skt. *śasā-* 'hare', Khotanese Saka *saha-*, Welsh *ceinach* (from **cein-* 'female hare' < **k̑has-n-*), OHG *haso* (Ger. *Hase*), OE *hara* (Engl. *hare*), OIcel. *heri*, OPruss. *sasins* 'hare'. The original meaning is 'gray', preserved in some dialects: Lat. *cānus* 'gray', OHG *hasan* 'flecked with gray', OE *hasu* 'gray'; cf. also Gk. *ksanthós* 'light-haired'. The **a* root vocalism is striking (see I.3.1.2 above), as is the case also with **thauro-*.

In Baltic (except for Old Prussian, see above) and in Slavic there is a taboo replacement by descriptive forms like Russ. *zajac* 'hare' (lit. 'jumper': cf.

Skt. *háya-*, Arm. *ji* 'horse' beside Skt. *hinóti*, *hínvati* 'drives, urges on', Pokorny 1959:424, Vasmer 1964-1973:II.84), Lith. *kiškis* (with other terms in various dialects: Būga 1958-1961:II.674); cf. also Russ. *serjak* 'hare' from *seryj* 'gray'.

In Old Hittite texts enumerating 'animals of the gods' we find an animal name *šaša-*, positionally identifiable with the Sumerogram DĀRA 'mountain goat'. The verb that combined with this animal name, to judge from KUB XIX 1 III 43ff., was *kunk-* 'shake, hang(?)'; and *šaša-* is contrasted with SILÁ 'lamb' (Goetze 1962:29). *šaša-* was obviously an animal of small size, ritually significant in Hittite tradition and equatable to a 'jumping goat'. In view of its formal correspondence to Skt. *śasá-* 'hare', the Hittite word could have had the same meaning. In that case the Hittite word must be considered a borrowing from Aryan (the regular Hittite reflex should be **kaša-*), unless it is due to assibilation of the initial **k-* (Josephson 1979 admits assibilation of **k^h-* before *a* in Anatolian).

2.1.11. Squirrel, polecat, and ermine

2.1.11.1. The term for 'squirrel' in the Indo-European dialects

A reduplicated form meaning 'squirrel' or 'polecat' is attested in a number of Ancient European dialects and also in Iranian. Lith. *vėveris*, *vaiveris* 'squirrel', 'male polecat, squirrel, marten, or chamois' (Būga 1958-1961:II.652), Latv. *vāvere* 'squirrel', OPruss. *weware* 'squirrel', ORuss. *věverica*, *viverica* 'squirrel', Russ. *veverica* 'squirrel; ermine', Lat. *uūerra* 'ferret'. The word is an Ancient European dialect innovation **we(i)wer-*, which could have referred to one or another small forest mammal.

In Germanic, due to the special mythological significance of the squirrel, the original word was replaced by the descriptive form **aik-werna* (**aik* 'oak'): OIcel. *íkorne* 'squirrel', OHG *eihhurno* (Ger. *Eichhorn*), OE *ācweorna*. In the Edda, the squirrel (*íkorne*) is depicted as the liveliest animal of the Middle World, constantly running through the Cosmic Tree and uniting the upper part with the lower (*Grímnismál* 32). In Latvian folk songs the squirrel is asked to give fur, using the same formulas as are applied to other fur-bearing animals, notably the otter and beaver (Mühlenbach and Endzelin 1923-1932:IV.512).

There is another dialectal term for 'ermine, weasel' in Germanic, Baltic, and Venetic (see Pokorny 1959:573-74): OHG *harro* 'ermine' (cf. Ger. *Hermelin*), Lith. *šarmuō*, *šermuō* 'ermine', *šarmonys* 'weasel', Latv. *sērmulis* 'ermine' (Fraenkel 1962-1965:II.965). For 'weasel' Germanic uses a term derived from **weis-*, which denoted a strong or musky odor (Pokorny 1959:1134): OHG

wisula (Ger. *Wiesel*), OE *weosule* (Engl. *weasel*).

In view of the late, dialectal nature of the words for 'squirrel', 'weasel', and 'ermine', no corresponding semanteme can be reconstructed for Proto-Indo-European.

2.1.12. Monkey or ape

2.1.12.1. A reconstructed Proto-Indo-European word for 'ape', and its connections with Southwest Asian words

Widely distributed cognate words for 'monkey, ape' in the ancient Indo-European dialects make it possible to posit a well-defined protoform at the Proto-Indo-European time depth. The cognates fall into two formal sets, one with initial *k-* and one without it. Skt. *kapí-* 'monkey' (from Vedic on; cf. personal name *Vṛṣākapí-*, lit. 'male monkey'), Gk. *kēpos* ~ *kēbos* 'long-tailed monkey' (cf. also Gk. *píthēkos* 'monkey, ape' < *[*ka*]pithekos?); OIcel. *api*, OE *apa* (Engl. *ape*), OHG *affo* (Ger. *Affe*), Celtic *abrános* (the Celtic word for 'monkey, ape', according to Hesychius: see Pokorny 1959:2-3), ORuss. *opica* (*opiica*), *opyni* 'monkey, ape' (Sreznevskij 1958:II.682-83, 700-701),⁴¹ OPol. *opica* (15th century), Cz. *opice*, USorb. *wopica*, Polab. *opó*, Serbo-Cr. *öpica*, Slovene *öpica*.

The alternation of initial *k-* and \emptyset - points to an earlier postvelar **q^h-*, with its regular reflexes of *k* and \emptyset in the respective dialects (see I.2.4.6 above). The protoform can be reconstructed as **q^he/op^h-*, with a variant **q^he/op-*, due to dissimilation of aspiration (see I.1.4.3 above), reflected in Germanic. The word is obviously an ancient Southwest Asian migratory word, attested in a number of Near Eastern languages, including Afroasiatic, in which it goes back to the earliest historical stages: Akkad. *uḫūpu*, *i/aḫūpu* (von Soden 1981:III.1427), Hebr. *ḵôṭṭ*, Aram. *ḵôṭṭā*, Egypt. *gjf* 'monkey, ape' (Erman and Grapow 1955:V.158). Semitic has an emphatic (postvelar) *ḵ*, which is in accord with the reconstructed postvelar **q^h* of Indo-European.

Since the term for 'ape, monkey' is found in both Proto-Indo-European and Proto-Semitic, its source cannot be determined (see Mayrhofer 1956:I.156). In its areal distribution and age of borrowing the word belongs to the same class as those for 'leopard; panther', 'lion', and 'aurochs; wild bull'.

41. Several investigators posit a Slavic borrowing from Germanic (Vasmer 1964-1973:III.144-45), although there is insufficient evidence for this claim. ORuss. *opyni* probably belonged to the East Slavic pagan lexicon; playing games with a monkey or bear was considered a sin. The other Russian word, *obez'jana*, represents a later borrowing from Persian *būzina*, possibly via Turkic.

2.1.13. Elephant and ivory

2.1.13.1. Early dialect terms for 'elephant' and their connection to Southwest Asian migratory terms

Despite the restricted dialect distribution of cognates, a word for 'elephant; ivory' can be reconstructed as **yebh-* (or **Hebh-*), going back to an early stage of dialect unity and reflected in a number of archaic words from only two dialects: Lat. *ebur* 'ivory; elephant', Skt. *ībha-ḥ* 'elephant'. Like the other animal names listed above, it is an evident Near Eastern migratory word, found in a number of ancient Near Eastern languages, including Afroasiatic: Egypt. *3bw* 'elephant' (Erman and Grapow 1955:1.7; on the evidence of Coptic *ebou*, *ebu* a protoform **(j)ebu* can be reconstructed), Hebr. *šen-habbīm* 'elephant tusk' (lit. 'tooth': *šen*).

In the same semantic sphere, an ancient migratory term for 'ivory' is found in other Indo-European dialects: Myc. Gk. *e-re-pa*, gen. *e-re-pa-to* 'ivory', adj. *e-re-pa-te-jo* 'made of ivory', Hom. *elēphas*, gen. *elēphantos* 'ivory', *elephánteios* 'made of ivory'. The word can be compared to Hitt. *laḥpa-*, in one text with Glossenkeil: *la-aḥ-pa-aš ú-nu-wa-an-du* 'let them decorate [it] with ivory', KUB XXXVI 25; in a trilingual Sumerian-Akkadian-Hittite text *laḥpaš* corresponds to Sumerian *zu* and Akkad. *šinnu* in the sense 'elephant tooth' (Laroche 1965b, Masson 1967:80-83).

Comparison of Hittite-Luwian *laḥpa-* and Gk. *elēphas*, gen. *elēphantos* permits us to regard the initial *e-* of the Greek form as the typical prothetic vowel of that language, and reconstruct a protoform **lebhonth-*; there is a regular reflex of zero grade **lbhonth-* in Goth. *ulbandus* 'camel'.⁴² Like the Latin and Sanskrit word for 'elephant', this one goes back to an ancient stage of dialect unity. Another word belonging to this set may be **alpi* 'camel', posited for Tocharian (the Tocharian word is proposed as a source of Central Asian loans of the form [arpa] 'camel': see Clauson 1973:40).

Evidently the speakers of individual Indo-European dialects who settled new territories and encountered camels for the first time transferred the word for 'elephant' to the unfamiliar large animal. Another group of dialects forms a

42. There are no formal grounds for considering Goth. *ulbandus* 'camel' (OSax. *olbundeō* 'camel', *Heliand* 3299; OE *olfend*, OIcel. *ulfalde*) a loan from Gk. *elēphas*, as is usually assumed. The regular phonetic correspondences of these words clearly allow them to be traced back to a common Proto-Indo-European form. For the semantic shift from 'elephant' to 'camel' in Proto-Germanic or earlier cf. the analogous development in Sumerian and Akkadian (Landsberger 1934:92, Nagel 1963:193). Goth. *ulbandus* was probably borrowed into Slavic as OCS *velbōdŭ* (Russ. *verbljud*) 'camel': Vasmer 1964-1973:1.293-94, cf. Sreznevskij 1958:1.241. The Slavic word for 'elephant' (Russ. *slon*) is borrowed from eastern Asiatic languages (archaic Chinese **sδāŋ*, Burm. *shāŋ* < **slāŋ* 'elephant': Pulleyblank 1963:23), whereas many western European languages borrow the word for 'elephant' from Greek via Latin.

new word for 'camel': Skt. *úṣṭra*- 'camel; buffalo' ('buffalo' in the Rigveda), Avest. *uṣṭrō* 'camel' (cf. the personal name *Zaraθ-uṣṭrō*, lit. 'camel driver': Mayrhofer 1977:43ff.; but see also Thieme 1981), from the root **wes-* 'moisten'.

Thus two words for 'elephant' can be reconstructed for archaic Indo-European dialect groupings, both in all likelihood of general Near Eastern origin: **yebh-* ~ **Hebh-* and **lebh-onth-* (possibly **leHbh-*, taking into account the Hittite-Luwian form). Comparison of the two protoforms suggests that they may ultimately be related to each other through a single Proto-Indo-European word for 'elephant', a form reminiscent of other words for 'elephant' in languages of the ancient Near East.

2.2. Animals of the Lower World

2.2.1. Serpent, snake, and worm

2.2.1.1. Indo-European words for 'serpent'; their variants and replacements in individual dialects

The serpent as a basic mythic being of the Lower World is represented by cognates in all the early Indo-European dialects, cognates which reveal some phonetic variation: Skt. *áhi-* 'serpent', Ved. *Áhi- Budhnyá-* 'Serpent of the Depths', Av. *aži-* 'serpent', Gk. *óphis* 'snake; grass snake', Arm. *iž* 'snake, viper': PIE **oghoi-*. Lat. *anguis* 'snake; serpent; dragon', Mlr. *esc-ung* 'eel' (lit. 'water snake'), Lith. *angis*, OPruss. *angis*, ORuss. *už* 'snake species', Russ. *už* 'adder, viper', Arm. *awj*: PIE **anghoi-*.⁴³ Gk. *ékhis* 'snake', *ékhidna* 'mythological snake': PIE **eghi-* (see below for a possible Germanic reflex of this form in OIcel. *ægir* 'Serpent'). This latter stem forms the basis for the term for a species of hedgehog, lit. 'snake-eater' (apparently the reference was to a mongoose, which kills poisonous snakes): Gk. *ekhḗnos* 'hedgehog', Oss. *wyzyn/uzun*, Arm. *ozni*, Lith. *ežys*, Latv. *ezis*, Russ. *ež*, OHG, OE *igil* (Ger. *Igel*) 'hedgehog'.

43. A Baltic and Slavic semantic innovation from the same Indo-European root is the word for 'eel', a fish common in the Baltic Sea basin: OPruss. *angurgis*, Lith. *ungurys*, Russ. *ugor* (Toporov 1975-:I.88-89); cf. also Lat. *anguilla* 'eel'. The original meaning 'snake, worm' is reflected in Germanic cognates: OHG *angar* 'larva' (Ger. *Engerling*), OPruss. *anxdris* 'grass snake', Lith. *inkštiras* (Toporov 1975-:I.96). Cf. Gk. *imbēris · égkhelus* (Hesychius; evidently in the meaning 'water snake'); the Greek word *égkhelus*, which corresponds formally to both PIE **anghoi-* and **eghi-* (Pokorny 1959:44), means 'water snake' but not 'eel', since it is opposed to the generic term *ikhthūs* 'fish' as in Homeric *egkhélus te kai ikhthúes*, Iliad 21.203 and 353. Therefore, *contra* some investigators (Watkins 1971:1500, cf. Pokorny 1959:43-44), an original meaning 'eel' cannot be reconstructed for Proto-Indo-European **anghoi-* 'snake' (for the dialectal nature of these words see Porzig 1954:125, 202 [1964:188, 298]).

The words show phonetic differences, evidently correlated with semantic differences. The original root **eǵhi-*, preserved in the archaic derivative, undergoes taboo transformations, yielding two different forms **anghoi-*, **oghoi-*, names for 'snake' and 'serpent' as mythic and ritually significant beings.

In a number of dialects this taboo leads to complete replacement of the original word by neologisms like Lat. *natrix* 'water snake', OIr. *nathir*, Goth. *nadrē*, OIcel. *naðr*, OHG *nātara* 'adder' (Ger. *Natter*), Engl. *adder* (an Italic-Celtic-Germanic isogloss: Porzig 1954:101, 125 [1964:153, 188]). Another is Skt. *sarpá-* 'snake, reptile', Lat. *serpēs* 'snake' (in Pliny the word also refers to small crawling insects), Gk. *herpetón* 'crawling animal' (Wackernagel 1953:I.165), from PIE **serph-* 'crawl': Skt. *sárpati* 'crawls', Gk. *hérpō* 'crawl', Lat. *serpō* id., etc.

Slavic preserves the original term **ǵǵi* as the name of a particular species of snake, while the meaning 'mythic serpent, dragon; serpent in general' is expressed by a euphemism: OCS *zmĭja* 'snake; dragon' (*óphis, drákōn*), originally 'crawling on the ground; belonging to the Lower World' (cf. Alb. *dhémje* 'caterpillar'), from PIE **ǵh₂dh-e/om-* 'earth'. Another euphemism is the Germanic designation of 'serpent' and 'mythic serpent, dragon' as 'worm': Goth. *waúrms* 'snake', OIcel. *ormr* 'serpent' (e.g. in the Edda: *Miðgarðs-ormr* 'Snake of the Middle World', which marks the boundary of the earth and is the 'belt of all the lands', *umgǵjörð allra landa*). This euphemism is based on the original meaning 'worm; insect'.⁴⁴ In some Germanic languages, this meaning is found together with that of 'serpent': e.g. OE *wyrm* 'serpent; dragon; worm', Engl. *worm*. Elsewhere, the word preserves its original meaning, while 'serpent' is named by one of the words just reviewed: cf. Lat. *uermis* 'worm', Gk. *rhómos* 'wood worm', Lith. *vařmas* 'insect; mosquito', ORuss. *vérmie* 'locust; worms'. The same word provides a term for red or purple dye in a number of dialects: OPruss. *wormyan* 'red' (lit. 'worm-colored'), Ukr. *vermjanij* 'red', OHG *wurmoht*, *wurmrōt*, *wurmfar* 'dyed red', OE *wurma* 'purple' (a Balto-Slavic-Germanic isogloss): PIE **w̥rmi-*, **w̥rmo-*.⁴⁵

44. Comparable semantic shifts among the meanings 'worm', 'insect', 'snake', and 'lizard' are found in other cognate sets, and can be explained as resulting from the assignment of all these animals to a single category. The word meaning 'lizard' in one dialect group (OCS *ašterŭ*, Russ. *jaščerica* 'lizard', Latv. *šķīrgailis*, Alb. *hardhėlē* 'lizard') has cognates meaning 'worm' (Gk. *skarlís* 'worm species') and 'insect' (Lith. *skėrŷs* 'locust', cf. Gk. *kóris* 'bedbug' with a different initial) in other dialects.

45. There is phonetic similarity between this stem and another Indo-European stem with the same meaning, **k^hōrmi-* 'worm': Skt. *kṛmi-* 'worm', Sogd. *kyrm-* 'worm', Pers. *kirm* 'worm', Oss. *kalm* 'snake, worm', OIr. *cruim* 'worm', OPruss. *girmis* 'larva', Lith. *kirmis* 'worm', OCS *čřivŭ* 'worm' (the source of the Slavic word for 'red': OCS *čřivenŭ* 'red', a perfect analogy to the word 'red' formed from the other stem **w̥rmi-*).

The word for 'ant', **mor-w-/w̥or-m-*, is formally related to these words: Russ. *muravej*, Gk. *bórmaks* 'ant', Skt. *vamrá-* 'ant' (see I.4.1.3 above). The semantic relatedness of

These taboo replacements for 'mythic serpent; snake' in Indo-European dialects become understandable in the light of the special mythological role of the serpent in all the ancient cultural traditions.

2.2.1.2. The basic motif connected with the serpent in Indo-European mythology

The basic mythic motif connected with the serpent is the struggle of the uppermost deity with the main embodiment of the Lower World. Archaic Indo-European mythic motifs depict the killing of the serpent by his divine opponent. Comparison of the archaic traditions makes possible the reconstruction of whole text fragments of this Indo-European myth, in which the ancient name of the serpent is used. The Rigveda (I, 32, 1-2) reflects these texts in the following formulas: *áhann áhim párvate śísriyānām* 'he killed the dragon (*áhim*), which was resting on the mountain', *áhann áhim ánv apás tatarda prá vakṣānā abhinat párvatānām* 'he killed the dragon (*áhim*), he made an opening for the rivers, he cut apart the waist of the mountains'. In the Avesta the same motif is reflected in passages such as *yō Janaṭ aži̯m srvarəm yim aspō.garəm nərə.garəm* 'he who killed the horned serpent (*aži̯m*), who devoured horses, devoured people' (Yašt 9, 11). There is a striking semantic and lexical parallel in a passage in the Edda, which confirms the possibility of reconstructing these text fragments for Proto-Indo-European (*Helgakviða Hundingsbana* I:55.5):

er þú felt hefir inn flugar trauða

jǫfur, þann er olli ægis dauða

'You, who overthrew the wild boar who disdained to flee, you who called forth the death of the serpent (*ægir*)'⁴⁶

Just as in the myth the uppermost deity overcame the serpent to free nature, in healing rituals the shaman priest rids the patient of 'worms' which are identified with mythic serpents, e.g. in the Atharvaveda (II, 31, 5):

ye kṛmayah parvateṣu vaneṣv osadhīṣu paśuṣv apsv antaḥ

ye asmākam tanvaṃ āviviśuḥ sarvaṃ tad dhanmi janima kṛmīnām

'Those worms which are in the mountains, in plants, in animals, in the water, those which have come into our body, I crush the worms' entire clan'

these roots is confirmed by the possibility of using **k^hormi-* in the meaning 'ant', shown by Lith. *skirvinti* 'run around like an ant' (Specht 1944:45).

46. Here and in some other older Germanic texts, OIcel. *ægir* and its cognates are to be interpreted as cognates to Gk. *ékhis*, Skt. *áhi-* 'serpent' (Plassmann 1961:111ff.); OIcel. *ægir* is also found in the compound *ægis-hjálmr* 'snakelike helmet', elucidated as *lorms líki* 'like the worm (i.e. serpent)' (Plassmann 1961:95; for *ægir* see also pp. 121-24).

In the incantations against worms and the mythic texts about the serpent-slaying god in the archaic Indo-European traditions, not only the lexemes coincide, but also such essential traits as the magic number nine ('nine worms', 'nine daughters of the Serpent', etc.): see Toporov 1969:25-27, Plassmann 1961:121-24.

In some archaic Indo-European traditions where the original word for the mythic Serpent is lost (as with Hitt. *Illuyankaš* 'Serpent'; or Gk. *Púthōn*, from PIE **b^hudh-* 'Lower World', see II.1.4.5 above), the complete structural scheme of the myth and its individual details are preserved. For instance, the Serpent steals body parts of his divine opponent (his eye, *šakuwa*, and heart, *kir*, in the Hittite variant); a woman or goddess helps the serpent-killing god (Inara in the Hittite myth, Athena in the Greek one). After a temporary victory by the serpent, the god reassembles his body and from the sky he kills his enemy in the Lower World (see Kretschmer 1927, Fontenrose 1959; cf. Littleton 1970).

This entire complex of motifs concerning a one-on-one battle of the ranking deity with the serpent or dragon is highly characteristic of all mythic traditions of the Near East and Caucasus, from the earliest Sumerian written sources to folklore themes of medieval and modern times (see Ivanov and Toporov 1974:136ff.).

2.2.2. Otter, beaver, and water animal

2.2.2.1. Indo-European dialect terms for 'water animal', 'otter', 'beaver'

Lexemes which in some dialects (Iranian, Baltic, Slavic, Germanic, Latin, Celtic) refer to specific animals, the otter (*Lutra vulgaris*) and beaver (*Castor fiber* L.), in other dialects (Hittite, Greek, Armenian, Indo-Aryan) mean 'water animal' in general and often have ritual and/or cultic significance. These ritually significant water animals are named descriptively, as 'water dogs' or with derivatives from **wot'or-* 'water'. A Hittite rendition of a Hurrian myth about a water monster Hedammu (KUB VIII 67 IV 17) relates how it devoured 'stream dogs', *ÍD-aš UR.ZÍRHI.A* (the same passage contains the analogously constructed *IKU-aš KU₆HI.A* 'field fish', apparently 'lizards': Friedrich 1949:233, 248). The reference is evidently to a small water-dwelling mammal, which is compared to a dog. In Greek, a derivative of the Indo-European word for 'water' refers to a water monster: *húdroš* 'Hydra' (Iliad 2.723), with the later attested feminine *húdrā* 'water snake'. In Sanskrit a derivative of the same root, *udrá-*, means 'water animal'; it is clearly a substantivized adjective meaning 'pertaining to water' (cf. Vedic *an-udrá-* 'waterless').

Reference specifically to otters (*Lutra vulgaris*) is attested in Waigali *wacak'ok* 'otter' (Morgenstierne 1954:222), Avest. *udra-*, Oss. *wyrd*, *urdæ*,

Russ. *vydra*, Lith. *údra*, OPruss. *udro*, OHG *ottar*, OIcel. *otr*, i.e. in the Iranian-Balto-Slavic-Germanic dialect area. It is evidently a semantic innovation of this dialect group, shared by Iranian but not Indic. It is interesting that there is also a word specifically meaning 'beaver' (*Castor fiber*) in the same set of dialects plus Italic and Celtic, while the group of dialects that lack 'otter' also lack 'beaver'.

The Common Indo-European word for 'beaver', **bhibher* ~ **bhebbher*, preserves an original meaning 'brown' or 'shiny' in some of the dialects which lack it in the meaning 'beaver'. The word is attested in the Rigveda in the sense 'red-brown' (of horses, cows, gods, plants), Ved. *babhrú-*; in Mitannian Aryan *bapru-*nnu** is a horse color (Mayrhofer 1966:137ff., 1974:§7); the non-reduplicated cognate is a horse color term in Slavic: Pol. *brony* 'bay', OCzech *brony* 'white', ORuss. *bronyi* 'white'. In later Sanskrit the term refers to a specific animal, the ichneumon (*Herpestes ichneumon*, a long-tailed species of mongoose that kills otters and mice). In Greek the non-reduplicated cognate means 'toad', which is consistent with the meaning of Old Prussian *brunse* 'roach; small fish', Lith. dial. *bruñšė* (Toporov 1975-:I.256-57).

In the other dialect group the same root, in reduplicated form, means 'beaver': Av. *bawra-*, *bawri-*, Lith. *bebrūs/bēbras*, OPruss. *bebrus*, Russ. *bober*, OHG *bibar* (Ger. *Biber*), OE *beofor* (Engl. *beaver*), OIcel. *bjórr*, Lat. *fiber*, OBret. *beuer* 'fiber', 'castor'⁴⁷ (Toporov 1975-:I.203-5).

In summary, derivatives of **wot'or-* 'water' mean 'otter', and reduplicated derivatives of the color term mean 'beaver', only in a sharply limited dialect group which includes the later European dialects (Baltic, Slavic, Germanic, Italic, Celtic) and Avestan. This is apparently an innovation, one having to do with the particular ecological environment inhabited by speakers of these dialects. It is notable that the Indo-Iranian languages are split by this isogloss: Sanskrit shows the more archaic situation, while Avestan displays the innovation.

2.2.2.2. *The ritual and cultic role of the beaver in individual Indo-European traditions*

In this same area we find mythological and ritual significance for the otter and beaver, which can be connected to the role of these animals as basic representatives of the Lower World in western Asian cultural traditions. In the Avesta, the beaver is the sacred animal of Anahita, a female deity originally associated with the Lower World. In Slavic folk songs, 'black beavers' are associated with the roots of the Cosmic Tree (Ivanov and Toporov 1965:80). In Latvian folk

47. In Old Irish the same meaning is expressed descriptively: *dobor-chú* 'water dog'.

songs the Divine Twins dance in beaver and otter skins; the songs contain the words

*ūdri, ūdri, bebri, bebri,
duod man savu kažuociņu!*

‘Otters, otters, beavers, beavers,

Give me your pelts!’ (Mühlenbach and Endzelin 1923-1932:IV.406)

These features of Baltic, Slavic, and Avestan tradition find no parallels in other early Indo-European traditions, which gives cultural-historical confirmation of the secondary, environmentally determined origin of these animals’ significance.

2.2.3. *Mouse and mole*

2.2.3.1. *The Common Indo-European term for ‘mouse’*

A Common Indo-European term for ‘mouse’, **mūs-*, is attested throughout the main early dialects: Skt. *mūṣ-* ‘mouse’ (in this meaning in the Rīgveda), ‘rat’, Pers. *mūš* ‘mouse’, Oss. *myst*,⁴⁸ Gk. *mūs*, Arm. *mukn*, OCS *myši*, Lat. *mūs*, Olcel., OHG, OE *mūs* (Ger. *Maus*, Engl. *mouse*).

Beginning with the earliest Indo-European mythic conceptions the mouse is associated with burial rites and a female deity of the Lower World.

2.2.3.2. *The mythological and ritual role of mouse, shrew, and mole in early Indo-European traditions*

In Hittite tradition the mouse figures in rituals performed by priestesses to prevent death. In the Hittite-Luwian ritual KUB XXVII 67, the ‘Old Woman’ (Sumerogram SAL ŠU.GI) saves a person from death by tying a piece of tin — a symbol of death — to a mouse which is set free to run ‘beyond the mountains and valleys’, i.e. into the other world. Analogous motifs are connected with a mouse cult in Greek tradition, attested from the time of Homer (e.g. *Iliad* 1.39). The mouse was the cult animal of the god Apollo Smintheus,⁴⁹ in whose temple at Chrysa near Lectum promontory in Asia Minor mice were specially raised and kept beneath the altar. The god himself was depicted with mice or as standing on a mouse. Apollo’s son, the god of healing Asclepius, resurrected the dead,

48. Oss. *mystūlæg* ‘weasel’ (cf. Lat. *mustēla* ‘weasel, marten’) has the same root (Abaev 1973:II.143).

49. His name *Smintheús* can be etymologized on the evidence of the gloss *smínthos*, *smís · mūs* ‘mouse’ (Hesychius; see Grégoire 1949).

for which he was struck by Zeus's lightning (Grégoire 1949, Toporov 1975a).

In Germanic and Slavic traditions the mouse was a holy animal of a pagan goddess associated with burial rites and conceived of as blind. Among the East Slavs the Milky Way, in folk belief thought to be the path taken by the soul to the next world, was called *myšina tropka* 'mouse path' (Vasmer 1964-1973:III.27). A relic of the mouse rites is preserved in Slavic superstitions and games connected with Baba Yaga (Potebnja 1865:90-95), who can evidently be identified with the SAL ŠU.GI, 'Old Woman', of the Hittite-Luwian rite (Toporov 1963).

The magic role of the mouse woman is also reflected in Lithuanian folklore, specifically in the story 'The enchanted castle', where a mouse is the priestess under whose supervision boys undergo an initiation rite (Ivanov and Toporov 1965:95). The original term for 'mouse' was tabooed in Lithuanian and replaced by another word, *pelė*.

Mice and the female deity connected with them are conceived of as blind in Slavic and Germanic mythological beliefs and associated terms: Cz. *slepá baba* 'blind old woman', name of a game; Pol. *ślepa babka*, a game; Serbo-Cr. *sljepi miš* (lit. 'blind mouse') 'bat' and 'blind-man's buff', Ger. *blindes Mäusel* 'blind mouse' (Potebnja 1865:92). This permits us to link them to the sightless animals closely related to field mice: the bat and the mole (*Talpa europaea* L.).

The mole appears together with the mouse in a number of ancient mythological motifs connected with the god of healing Asclepius. The sanctuary (*thólos*, *thumélē*) of Asclepius in Epidaurus was built on the model of a mole's den. The god's very name can be etymologized as containing one of the Indo-European words for 'mole', Lat. *talpa*; it is also ultimately related to the Near Eastern name of the disappearing and reappearing god of fertility, Hitt. *Telepinu-*, Hatt. *Talipinu*, *Talipuna*, and to migratory terms for several of the animals associated with that mythic complex (Grégoire 1949, Toporov 1975a:42-43; these deities are discussed in more detail below).

In Sanskrit tradition the mole is venerated together with the god of healing Rudra, to whom the mole (Skt. *ākhú-*) belongs; prayers are addressed to Rudra, asking him to take away illnesses (Rigveda II, 33).

Despite the cultic significance of the mole as a sacred animal in Indo-European tradition, unrelated names for it have arisen separately in the various historical dialects, evidently due to taboo replacement of the original word.

The special cultic and ritual significance of the mouse and mole in Indo-European tradition, which associates them with burial rites and healing ceremonies, has its roots in prehistoric antiquity. In the ancient culture of Asia Minor in the seventh to sixth millennia B.C., we find traces of special cultic use of mice and shrews, which were placed in graves by the high priestesses; this symbolizes the connection of these animals with the highest female divinity (Mellaart 1967).

2.2.4. Turtle

2.2.4.1. Dialect terms for 'turtle'

The Indo-European words for 'turtle' form separate cognate sets in different dialect areas, which makes it impossible to trace any one of the various forms back to Proto-Indo-European. One group of cognates is Gk. *khélus* 'turtle', 'lyre', Serbo-Cr. *žělva* 'turtle', Slovene *žetva*, Czech *želva*, Russ. *želvak*, which require a protoform **ghel-u-*. In East Slavic the old word is tabooed and replaced by a derivative from *čerep* 'skull': Russ. *čerepaxa* (Zelenin 1929-1930:II.53).

Similar taboo processes could have led to the replacement of the original term in other Indo-European dialects, where we find new terms, a number of which go back to names of other animals of the Lower World. This may be the explanation of Skt. *kūrmá-ḥ* 'turtle', formally comparable to Lith. *kūrmis*, Latv. *kuřmis* 'mole'. These forms may reflect, with some phonetic reshaping, the same root as the protoform for 'worm': **kʰor̥mi-* (see note 45 above).

2.2.5. Crab

2.2.5.1. The Indo-European term for 'crab'

The primary term for 'crab' in the early Indo-European dialects is formed from a reduplicated base **kʰarkʰar-* (Pokorny 1959:531) meaning 'hard, rough': Skt. *karkara-* 'hard', Gk. *kárkaroi* · *trakheís* 'rough, hard (pl.)' (Hesychius). Words for 'crab': Gk. *karkínos* 'crab', Prakrit *karkaṣa-* 'crayfish', *karka-* 'crab', Lat. *cancer* 'crayfish', Russ. *rak*, Slavic **rakŭ* (with dissimilative loss of the initial **k-*) 'crayfish'. In Germanic there is a replacement (perhaps due to taboo) of the original word by a descriptive one related to **k'rebh-* 'crawl; scratch' (cf. Oícel. *krafla*, OHG *krappeln*): Oícel. *krabbi*, OE *crabba* (Engl. *crab*), MHG *krabbe* 'crab'; the same source gives OSax. *krebit* Ger. *Krebs* 'crayfish'.

2.2.6. Toad and frog

2.2.6.1. Descriptive names for 'toad' and 'frog'; their role in Indo-European mythology

Words primarily of a descriptive nature can be reconstructed for the meanings 'toad' and 'frog' in various dialect groupings; they are probably the result of euphemistic replacements for the name of this animal, which played an essential

role in mythological conceptions of the Lower World.

Forms from the Germanic-Balto-Slavic area go back to a common root of obviously onomatopoetic nature: OPruss. *gabawo* 'toad', Russ. *žaba*, Serbo-Cr. *žāba*, Czech *žāba*; OSax. *quappa* 'burbot'; cf. Lat. *būfō* 'toad' (assumed to be a loan from Osco-Umbrian): Vasmer 1964-1973:II.31.50

Another descriptive stem yielding words for 'frog' in Indo-European dialects is derived from **p^hreu-* 'jump' (cf. Skt. *pravate* 'jumps, hops'): Skt. *plava-* 'frog' (lit. 'one who jumps'), OIcel. *frauki*, OE *frogga* (Engl. *frog*) beside a parallel stem in *-sk-*: OIcel. *froskr*, OE *frosc*, Ger. *Frosch* 'frog'. The East Slavic word for 'frog' has a similar semantic origin: Russ. *ljaguška* from the root of *ljag-at* 'kick', *ljažka* 'thigh, haunch' (Vasmer 1964-1973:II.548-49).

The formal variability of words for 'toad' and 'frog' in Indo-European dialects⁵¹ may have to do with the character of these animals as representatives of the Lower World. In Slavic and Germanic traditions, worms, frogs, toads, mice, turtles, and all insects are the children or descendants of the beings of the Lower World; death and illness, especially of children, are associated with toads (Potebnja 1865:200-206). Cf. also the hymn to frogs in the Rigveda (VII, 103), where they are compared to Brahman priests.

2.2.7. Fly and gadfly

2.2.7.1. The Proto-Indo-European word for 'fly'

A Proto-Indo-European word for 'fly' can be reconstructed as **mu(s)-*: Gk. *muīa* 'fly, gadfly', Arm. *mun*, gen. *mnoy* 'mosquito', Lat. *musca* 'fly', OIcel. *mý* 'mosquito', OE *mycg*, OHG *mucka* 'mosquito', Lith. *musė*, OPruss. *muso*, Latv. *muša* 'fly', OCS *muxa* 'fly'. The original meaning of the word was evidently that of a stinging, irritating insect; Homer (Iliad 17.567-72) mentions an irritating fly which likes human blood.

2.2.8. Wasp and hornet

2.2.8.1. Dialect terms for 'wasp', 'hornet'

The set of words common to Ancient European dialects plus Iranian also

50. For the onomatopoetic nature of this root compare analogs like Russ. *kvakuška* 'frog' from *kvakat* 'croak', with many parallels: Lith. *kvaksėti*, Ger. *quaken* 'croak', etc. The Hittite text Bo 2738 I 7-8, 10 mentions the den or burrow (*ḫanteššar*, in other texts the serpent's den) of an animal *a-ku-wa-ku-wa-aš* which is identified as a frog or toad (Forrer *apud* Kretschmer 1927:310); but see Kammenhuber's objections in Friedrich and Kammenhuber 1975:I.

51. Other dialect terms include Oss. *xæfs* 'frog' < Old Iranian **kasyapa* 'frog' (Abaev 1949:I.51).

includes **wobhsā-* ‘wasp’: Pehl. *wabz* ‘wasp’, cf. Av. *vawžaka-* ‘scorpion’, Lith. *vapsvā* ‘wasp’, OPruss. *wobse*, Russ. *osa*, OE *wæfs* (Engl. *wasp*), OHG *wefsa* (Ger. *Wespe*), Lat. *uespa*, OBret. *guohi* ‘wasp’. The word is considered a derivative of **webh-* ‘weave’ (Pokorny 1959:1179); for this root, see below.

A similar group of Ancient European dialects also shows a common term for ‘hornet’: Lith. *širšė*, OLith. *širšuō* ‘large wasp’, Latv. *sirsis*, OPruss. *sirsilis* ‘hornet’, ORuss. *s’ršen’*, Russ. *šeršen’*; OHG *hurnūz* (Ger. *Hornisse*), OE *hyrnet(u)* (Engl. *hornet*); Lat. *crābrō* ‘hornet’. The word goes back to PIE **k̑h₂s-en-*, the root that provides words for ‘horn’: the hornet is a ‘horned insect’. This word had a broader range, as is shown by Toch. A, B *kronše* in the specialized sense ‘bee’ (see below).

2.2.9. Louse and nit

2.2.9.1. Proto-Indo-European terms for ‘louse’ and ‘nit’

Words for ‘louse’ and ‘nit’ in Indo-European have a wide distribution in the dialects, but reveal a significant degree of phonetic variation, explainable by taboo reshaping of the original words.

OIce. *gnit* ‘nit; louse eggs’, Russ. *gnida*, Latv. *gnīda*, Lith. *glīnda*, Lat. *lēns*, gen. *lendis*; also cognate are Gk. *konís*, gen. *konídos* ‘nit’ (with devoicing of the initial consonant), Arm. *anic* (with metathesis of the consonants): PIE **ghnit’-*.

OIce., OHG, OE *lūs* ‘louse’; Welsh *llau* ‘lice’; Skt. *yū-kā* ‘louse’ (with loss of the initial **l-*), Lith. *vievesa* ‘louse’ (reduplication of the root without **l-*), ORuss. *v’š’*, Russ. *voš’*: PIE **lūs-*.

2.2.10. Fish and salmon

2.2.10.1. Indo-European dialect terms for fish as an animal of the Water World

Fish, as water animals, are placed in the Lower World in ancient views, together with other water animals as well as snakes, worms, and insects. The ancient mythological view of fish as animals of the Lower World, or underground, gives grounds for relating the word for ‘fish’ to that for ‘earth’ (see 2.2.1.1 above for the connection between ‘snake’ and ‘earth’ in Slavic). It is significant that the Greek word *ikhthūs* ‘fish’ and its cognates (Arm. *jukn*, Lith. *žuvis*, Latv. *zuvš*, OPruss. *suckis*) coincide with the Indo-European word for ‘earth’ (Gk. *khthōn*, Hitt. *tekan*, Toch. A *tkam*, Skt. *kṣam-*). The word for ‘fish’ goes back to a derivative in **-ū* from **dhēgh-* ‘earth’: **dhēghū-* ‘fish’, lit. ‘underground (animal)’, with subsequent phonetic alterations of the initial cluster.

In another dialect group — Latin, Celtic, and Germanic, from the Ancient European group — there is a different word for ‘fish’, evidently a dialectal innovation (see Porzig 1954:110, 171, 184, 193 [1964:165, 254, 272, 285]): ***pheiskh-** ~ ***phiskh-**: Lat. *piscis*, OIr. *íasc*, Goth. *fisks*, OIcel. *fiskr*, OHG, OE *fisk* (Ger. *Fisch*, Engl. *fish*); also Russ. *peskar*, *piskar* ‘gudgeon’ (but see Vasmer 1964-1973:III.267).

2.2.10.2. *The problem of the Indo-European word for ‘salmon’*

A number of dialects have a special term for one species of fish, the salmon: OHG *lahs* (Ger. *Lachs*), Lith. *lašišà*, *lāšis*, OPruss. *lasasso*, Russ. *losos*’, Oss. *læxæg* ‘salmon’. In Tocharian the cognate word Toch. B *laks* means ‘fish’ in general. The narrow dialect distribution of the word, and its absence from a number of dialects, demonstrates its late rise in its specialized sense as referring to a species of salmon, a spotted reddish fish found in rivers of the Caspian basin (*Salmo trutta caspius* Kessl.) and northern Europe (*Salmo salar* L.) (Berg 1955:335; cf. Krogmann 1960, Lane 1970:82-83). The word for ‘salmon’, ***lak̥h-**, can be traced to the Indo-European root ***lak̥h-** ‘red; spotted’: Skt. *lākṣā* ‘red lacquer’, Pers. *raxš* ‘spotted; red and white’⁵² (see Thieme 1953, Krause 1961, Abaev 1973:II.32n1).

As the speakers of Indo-European dialect groups migrated into new ecological environments, new words arose to refer to previously unknown animals found in the new territories. As a rule such words were formed from derivatives of inherited roots, the derivatives receiving specialized meanings. The word for ‘salmon’ in the dialect group just mentioned seems to have arisen in just this fashion.

2.3. Animals of the Upper World

2.3.1. *Bird and eagle*

2.3.1.1. *Indo-European words for ‘bird’*

A generic term for ‘bird’ in Indo-European can be singled out in the form ***Hwei-**: Skt. *ví-/vé-* ‘bird’ (in the Rígvēda the word is also frequently used of other beings which fly through the air: horses, gods, and sometimes arrows),

52. There is a precise semantic parallel in the words for salmon or trout in MÍr. *erc* ‘salmon, trout; spotted, dark red’, OHG *forhana*, MHG *forhe(n)*, *forhel* (Ger. *Forelle*), OE *for(e)* ‘trout’, from PIE ***p̥erk̥h-** ‘spotted’: Skt. *p̥r̥śni-* ‘spotted’, Gk. *perknós* ‘spotted; blackish; perch’, *pérkē* ‘perch’, lit. ‘spotted’.

Av. *vīš* 'bird', Pehl. *way*, *wāyendag* 'bird'; Gk. *aietós* 'eagle', Arm. *haw* 'bird; chicken'; Lat. *avis* 'bird', Umbr. acc. sg. *avif* '*aves*', Welsh *hwyad* 'duck'. The word is related to **Hwe(i)-*, originally 'blow', secondarily 'air', 'wind', and a generic term for the Upper World. Birds were of course seen as beings which fly through the air; this distinguished them from the beings of the Middle World, which move, run, or hop over the ground, and those of the Lower World, which crawl on the ground or live under the ground or in water (including insects and larvae, which were identified with the insects).

For flying, the means of locomotion of Upper World beings, Indo-European uses the root **pheth-*: Gk. *pétomai* 'fly', Skt. *pátati* 'flies', Lat. *petō* 'strive, seek, make way toward', Hitt. *pittai-* 'run; hurry; fly' (with semantic transfer). The same root forms derivatives in *-r/-n-* meaning 'feather', 'wing', 'flight': Hitt. *pattar*, gen. *pattanaš* 'wing', Gk. *pterón* 'feather; wing' (cf. Arm. *t'ir* 'flight', Skt. *patará-* 'flying', Av. *patarəta-* 'flying'), OHG *fedara* (Ger. *Feder*) 'feather', OE *feðer* (Engl. *feather*), Lat. *penna* 'feather, wing'. In a few separate dialects the word acquires the meaning 'bird': OIr. *én* 'bird', OWelsh *eterin* 'bird', and others.

In its meaning 'fly, flying' the root also appears in a compound: Skt. *āśu-pátvan-* 'fast-flying' (in the Rigveda *āśupátvā śyenás* 'fast-flying falcons'), Gk. *ōku-pētēs* 'fast' (lit. 'fast-flying'), Lat. *accipiter*, ORuss. *jastřeb* 'accipiter', Russ. *jastreb* (from original 'fast-flying'; for this comparison see Pisani 1975:161); PIE **ōk̑hu-ph(e)th-er-* (for the first element **ōk̑hu-* 'fast' cf. Gk. *ōkús* 'fast', Skt. *āśú-*, Av. *āsu-*, etc.).⁵³

2.3.1.2. The Indo-European word for 'eagle'

Among the inhabitants of the Upper World, special ritual and cultic significance is accorded the eagle, PIE **He/or-*: Hitt. *ḫaraš*, gen. *ḫaranaš* 'eagle', Pal. *ḫaraš* 'eagle', Gk. *órnis*, gen. *órnthos* 'bird', Myc. Gk. *o-ni-ti-ja-pi* 'of a bird' (Risch 1976:313),⁵⁴ Lith. dial. *arēlis*, *erēlis* 'eagle', Latv. *ērglis*, OPruss. *arelie* (= *arelis*), OCS *orlŭ*, Russ. *orel*; Goth. *ara*, OIcel. *ari*, OHG *aro* (Ger. poet. *Aar*), MHG *adel-ar* (Ger. *Adler*), lit. 'noble eagle', OE *earn*, OIr. *irar* 'eagle'; cf. Arm. *oror* 'kite; gull' (with semantic transfer).

53. The Latin form can be explained as the result of the change of **-k̑hw-* to *-kk-*, with the subsequent development of *-i-* to break up the consonant cluster: **akkpter* > *accipiter*. The Slavic form **(j)asū-str-ebū-* is a regular development of the same protoform, with **-phth̑r-* > *-str-* as in a number of other words (e.g. Russ. *stryj* 'paternal uncle', *Stribog*, high-ranked East Slavic pagan deity, both from **ptr-* 'father').

54. In Greek there is a semantic extension from 'eagle' to 'bird', with the generic meaning attested even in Homer. It is interesting that the Indo-European generic word for 'bird' acquires the meaning 'eagle' in Greek (*aietós*). Here we have a switch of generic and specific meanings in words belonging to the same category. Similar instances of semantic broadening include the change from 'lion' to 'wild animal' in Toch. A *lu*, 'salmon' to 'fish' in Toch. B *laks*.

2.3.1.3. The mythic role of the eagle in ancient Indo-European tradition. The connection of eagle and sea

In Indo-European tradition as reflected in Sanskrit and Old Icelandic mythology, the eagle is always at the top of the Cosmic Tree (Wilke 1922). In ancient Germanic traditions the eagle appears together with the sacred bear and wolf as the most important of the birds in terms of cultic functions; it is one of the three sacred animals of the afterworld Valhalla (Beck 1965:9, 97 et pass.).

In Hittite tradition, beginning with the earliest texts, the eagle is the main ritual bird, comparable in significance to the lion. In the Old Hittite ritual KUB XXIX 1 cited in note 22, 'they made eagle's eyes (for the king), and they made him lion's teeth'. In an archaic song to the god Pirwa (Bo 6483), an eagle (*ḫaranan*) is sent to the god from the city *Ḫaššuwa-* (lit. 'royal city'). The eagle often serves as messenger to the gods, flying to the sea and bringing news from there. This motif is repeated in the Old Hittite ritual of purification of the king and queen (Otten and Souček 1969), in the Telepinus myth, and especially clearly in the ritual KUB XXIX 1 (just mentioned), which reads (I.50): *nu GIŠDAG-iz ÁMUŠEN-an ḫal-za-a-i e-ḫu-ta a-ru-na pí-e-i-mi...* 'and the Throne summons the eagle: Go! I send you to the sea!' The eagle comes back and reports that he has seen (*šuwayaun*) the 'lower, former gods', *katterreš karuileš* DINGIRMEŠ (evidently the earlier gods, overthrown and relegated to the underworld).⁵⁵

This association of eagle and sea, or water in general, is probably a Common Indo-European mythological motif, as is reflected in archaic types of hydronyms and toponyms found in various Indo-European traditions which combine the element 'eagle' with 'sea', 'water', 'stream', etc. A clear example is the Old Hittite city name *URUḫa-ra-aš-ḫa-pa-aš* 'Eagle River City' (KBo III 54 B 13, Watkins 1973a:84), which finds an exact correspondence in toponyms such as the central European Celto-Illyrian *Arlape* (now *Erlaf*): Toporov 1975-:I.102.

Interestingly, in Latin the very word for 'eagle', *aquila*, is etymologically related to the word for 'stream, sea, water': Lat. *aqua*, Goth. *ahva* 'river', OE *ēagor* 'sea, stream', etc. This evidently represents a taboo replacement of the original word for 'eagle', the new term based on a property of this bird, which was associated with the sea or bodies of water;⁵⁶ the same explanation would account for the meaning of Arm. *oror* 'gull'.

55. Similar motifs occur in the Vedic hymn to the eagle (*śyenā-*), which 'knew all the generations of gods' (*avedam ahám devānām jānimāni víśvā*, Rigveda IV, 27, 1) and which brings the sacred beverage soma from the sky to Indra.

56. Under this etymological interpretation, Lat. *aquilō* 'north wind' and *aquilus* 'dark brown, brown-black' must be regarded as derivatives from *aquila* 'eagle' and not vice versa (see Pokorny 1959:23, Tovar 1973:77-82).

2.3.1.4. Taboo replacements for 'eagle' in individual Indo-European dialects

Taboo replacements of the word for 'eagle', ascribable to the eagle's special cultic and ritual significance in Indo-European tradition, can also be observed in other ancient Indo-European dialects, for instance Indo-Iranian, where several parallel forms meaning 'eagle' arise. One is Skt. *śyená-* 'eagle; falcon', Av. *saēna-* 'large bird of prey', possibly 'eagle'; the term is based on the bird's dark gray color and comes from **k̑hyē-*: Skt. *śyāvā-* 'dark brown; dark', Av. *syāva-* 'black', Pers. *siyāh*, Russ. *sivj* 'gray', *sinij* 'bright blue'.

In early Sanskrit, beginning with the Rigveda, *śyená-* is used together with the epithet *ṛjipyá-* 'fast-flying', cognate to the basic word for 'eagle' in Iranian;⁵⁷ the Iranian term evidently arose from the earlier epithet: *árksiphos · aetòn parà Pérsias* 'eagle in Persian' (Hesychius); cf. Av. *ərəzifya-* 'eagle', Pehl. *ālūh* < **arduf*, Pers. *ālūh*. The same ancient Indo-European epithet underlies Arm. *arcui* 'eagle' (Hübschmann 1897[1972]:424-25, Ačarjan 1971:I.319-20, Greppin 1978:45ff., Tumanjan 1978:194), borrowed into Georgian as *arc'iv-i* 'eagle'. The same epithet is the source of the name of the Urartean king Menua's horse *Aršibini* (Melikišvili 1960:204-5, Lamberterie 1978:251-62).

2.3.2. Crane

2.3.2.1. The Indo-European term for 'crane'

The Proto-Indo-European word for 'crane' comes from the root **k'ér-*, possibly of onomatopoeic origin (cf. Skt. *járate* 'sounds, makes noise'): Gk. *gérēn*, *géranos* 'crane', Arm. *kṛunk*, Oss. *zyrnæg* 'crane', Lith. *gėrvė*, Latv. *dzērve*, OPruss. *gerwe*, Russ. *žuravl'*, OHG *kranuh* (Ger. *Kranich*), OE *cranoc* (Engl. *crane*), Lat. *grūs*, gen. *gruis* 'crane'. Since cognates are present in Greek and Armenian, the absence of a Sanskrit cognate must be due to later loss.

2.3.3. Raven and crow

2.3.3.1. The Indo-European word for 'raven' as onomatopoeic

The onomatopoeic root **k'ér-* is evidently cognate to **kher-/khor-/khr-*,

57. Other Indo-Iranian euphemisms for 'eagle' include Oss. *cærgæs* 'eagle', originally 'kite; bird of prey', lit. 'chicken-eater'; Sogd. *crks* 'bird of prey', Av. *kahrkāsa-*, Pers. *kargas* 'kite' (Abaev 1958:I.302-3).

also onomatopoeic, which gives the Proto-Indo-European word for 'raven': Skt. *karāṭa-* 'crow(?)', *karāyikā* 'crane species', Oss. *xalon* 'crow' (Abaev 1949:I.50), Gk. *kóraks* 'raven', *korónē* 'crow', *kóraphos · poiòs órnīs* 'a bird' (Hesychius), Lat. *coruus* 'raven', *cornīx* 'crow', Umbr. *curnaco* 'cornicem', 'crow' (acc.). A form with initial *w-, found in Balto-Slavic-Tocharian, must be regarded as a phonetic innovation from *k^hor-n- (alternations of the type *k^hr-m- ~ *k^hor-m- ~ *w^r-m- are characteristic of many animal names: see 2.2.1.1, note 45, above): Lith. *várna*, OPruss. *warne* 'crow', Russ. *vorona* 'crow', Toch. B *wrauṇa* 'crow' (Trubačev *apud* Vasmer 1964-1973:I.353).

In some Indo-European traditions, especially Germanic, the raven is close to the eagle in its cultic significance, specifically as a sacred bird of Valhalla (Beck 1965:9ff.). The word for 'raven', with which sacral traditions are associated, figures in a large number of terms belonging to cultic and poetic language.⁵⁸ Significantly, in Germanic the ancient, Proto-Indo-European word for 'raven' is replaced by a derivative of *k^her-, the root underlying the Proto-Indo-European word for 'crane': OE *crāwe* (Engl. *crow*), OHG *krā(w)a* (Ger. *Krāhe*) 'crow', OIcel. *kráka* 'crow', *krákr* 'raven'.⁵⁹

2.3.4. Thrush, starling, sparrow

2.3.4.1. Dialect terms for these birds in Indo-European

A word for 'thrush' or 'starling', reconstructed as a set of onomatopoeic variants, is attested in the Ancient European dialects: Lat. *turdus* 'thrush', Mlr. *truit*, *druit* 'starling', OIcel. *þręstr* 'thrush', OHG *droscala* (Ger. *Drossel*), OE *ðrysce* (Engl. *thrush*), OPruss. *tresde*, Lith. *strāzdas*, Latv. *strazds* 'thrush', *mēlnais strazds* 'starling' (lit. 'black thrush', Mühlénbach and Endzelin 1923-1932: III.1083), Russ. *drozd* 'thrush, blackbird'. Gk. *strouthós* 'sparrow' is probably also cognate, in which case the semantic difference requires positing a semantic innovation which gave the meaning 'thrush' in the Ancient European dialect group.

Another dialect stem meaning 'sparrow', 'starling' is *spher-k^h-. Gk. *sparásion · órneon empherēs strouthōi* (Hesychius), Epic *psér* 'starling', Goth. *sparwa* 'sparrow', OE *spearwa* (Engl. *sparrow*), OHG *sparo* (Ger. *Sperling*), OIcel. *spęrr*.

58. Echoes of the ancient cultic symbolism of the raven can be perceived in recent Romantic literature, e.g. in Poe's 'The Raven', the ballads of Robert Southey, etc.

59. In the modern West Germanic languages the word for 'raven' apparently undergoes a second taboo replacement: Ger. *Rabe*, Engl. *raven*.

2.3.5. Black grouse and capercaillie

2.3.5.1. The Indo-European term for 'black grouse'

A reduplicated root of onomatopoeitic origin, ***theth(e)r-**, is represented in all the main Indo-European dialect groups:⁶⁰ Skt. *tittirá-* 'partridge', Pers. *taḍarv* 'pheasant', Arm. *tatrak* 'turtledove', Gk. *tetráōn* 'capercaillie', OPruss. *tatarwis* 'female black grouse (grayhen)', Lith. *tetervà*, Latv. *teteris* 'black grouse', Russ. *teterev*, OIcel. *þiðurr* 'capercaillie'; cf. OIr. *tethra* 'crow' from the same root. Despite the antiquity and Proto-Indo-European nature of the term, it is not possible to determine its precise original meaning or the bird it referred to. The majority of historically attested meanings point to 'black grouse' or 'capercaillie', 'pheasant(?)'.

2.3.6. Woodpecker, small songbirds, and finch

2.3.6.1. The Indo-European word for 'woodpecker'

Proto-Indo-European ***(s)phikho-** 'woodpecker' gives regular correspondences in the main early Indo-European dialects: Skt. *piká-* 'Indian cuckoo', Lat. *pīcus* 'woodpecker', *pīca* 'magpie', Umbr. *peico* (acc.) '*picum*', 'woodpecker', OHG *speh*, *speht* (Ger. *Specht*), OIcel. *spætr* 'woodpecker', OPruss. *picle* 'thrush'. In Slavic the word is tabooed and replaced by an archaic derivative of ***t'enth-** 'tooth': Slavic **dętilŭ*, lit. 'toothed', Russ. *djatel*, Serbo-Cr. *djètao*, Pol. *dzięcioł*, see Vasmer 1964-1973:I.562. This indicates the ritual significance of the bird in ancient tradition; and in fact in Roman tradition the woodpecker appears together with the wolf as one of the most important sacred animals (Dumézil 1966:201 et pass.).

2.3.6.2. Indo-European terms for small songbirds and finches

Probably related to ***(s)phikho-** 'woodpecker' is an onomatopoeitic root with a glottalized consonant ***(s)pink'o-**, referring to a small bird.⁶¹ The various dialectal derivatives of this word have in common that they refer to small birds. Gk. *spíggos*, *spíza* 'finch', OHG *fincho* (Ger. *Fink*) 'finch', OE *finc* (Engl.

60. In addition to normal reduplication, there is an intensive reduplication found in several onomatopoeitic bird names: ***e/ophoph-**: Gk. *épops*, gen. *épopos*, Lat. *upupa* 'hoopoe', Lith. *pupūtis*, Latv. *pupuķis*, *pupiķis* 'hoopoe'.

61. This semantic interpretation of the onomatopoeitic bird names is supported by universals of sound symbolism, where glottalized sounds symbolize small size, in comparison to unglottalized sounds (see Gudava 1958, also Jakobson and Waugh 1979:204).

finch), Swed. *spink*, *spikke* 'small bird; sparrow'. Terms for birds of prey which attack finches and sparrows are formed from the same stem: Gk. *spiziās* 'accipiter', Skt. *phīṅgaka-* 'bird of prey with a forked tail'.

2.3.7. Goose, water bird, swan, duck

2.3.7.1. The Indo-European word for 'goose' or 'swan'

While the bird names just surveyed are based on onomatopoetic roots reflecting the calls of the birds, the Indo-European word for 'swan' or 'goose', in contrast, is not obviously of onomatopoetic or descriptive origin.⁶² The stem is reconstructed as **ǵhans-*, with original **a* vocalism: Skt. *hamsá-* 'wild goose; swan', Sogd. *z'y* 'bird species', Gk. *khēn*, gen. *khēnós* 'goose', Lith. *žasis* 'goose', Latv. *zūss*, OPruss. *sansy*, Russ. *gus'*, Lat. *ānser* (from **hanser*) 'goose', OIr. *géiss* 'swan', OHG *gans*, OE *gōs* (Engl. *goose*), OIcel. *gás* 'goose'. The reconstructed word meant 'wild goose, swan' in Proto-Indo-European, as is clear from the meanings of Sanskrit *hamsá-*. Domestication of the goose clearly took place after the breakup of Proto-Indo-European into dialects.⁶³

In Sanskrit tradition the wild goose (*hamsá-*) is functionally equated to wild animals of cultic significance. According to the Rigveda the word refers to a water bird with a black back which flies in flocks, to which the divine Ashvins and their flying horses are compared; the word is frequent in the Rigveda. The wild goose or swan continues to play an essential cultic role in later Indic traditions; it is considered sacred and is one of the attributes of Brahma.

An Indo-European root **e/ol-* with the general meaning 'water bird, waterfowl' (cf. Gk. *elēā* 'small marsh bird') subsequently forms two new terms in the Ancient European group: Celtic-Italic (Corn. *elerch*, cf. Mlr. *elae*, Lat. *olor* 'swan') and Germanic-Slavic (OIcel. *elptr*, OHG *albiz*, Russ. *lebed'*: Porzig 1954:102, 144 [1964:153, 215]).

2.3.7.2. A dialectal Indo-European term for 'duck'

The duck was domesticated at a relatively late period, after the breakup of dialect unity; its Proto-Indo-European name **anĥt-* can be reconstructed with

62. There is, however, the possibility that the root may ultimately be related to **ǵhagha-* 'honking (of geese)': OIr. *gigren* 'goose' beside MHG *gāgen* 'honk', Russ. *gogol'* 'goldeneye (duck)', OPruss. *gegalis* 'small diving bird'; cf. Hitt. *kallikalli-* 'falcon' (Trubačev *apud* Vasmer 1964-1973:I.425).

63. Derivatives of **ǵhans-* still preserve the reference to a wild bird in some individual Indo-European dialects: Lith. *gañdras* 'stork', OPruss. *gandarus*, OE *ganot* (in the poem 'The Seafarer'), Engl. *gannet*.

the meaning 'wild duck': Skt. *āti-* 'waterfowl', Khotanese Saka *āce*, *āci* 'waterfowl', Oss. *acc* 'wild duck', Wakhi *yōč* 'duck' (Abaev 1958:I.27), Gk. *nēssa*, Boeot. *nāssa* 'duck', Lith. *ántis* 'duck', OPruss. *antis* (Toporov 1975-:95-96), Russ. *ut*, *utka*, *utva*, Lat. *anas*, gen. *anatem* (*anitem*), OHG *anut* (Ger. *Ente*), OE *æned* 'duck'.

Chapter Three

Indo-European terms for domestic animals. The economic functions of animals and their ritual and cultic role among the early Indo-Europeans

3.1. Animals which were ritually close to man

3.1.1. The horse

3.1.1.1. The Proto-Indo-European term for 'horse'

The Proto-Indo-European term for 'horse', **ek̑h₂wos* (without formal distinction between the masculine and feminine gender), is attested in all the early Indo-European dialects: Hier. Luw. *á-sù-wa* 'horse' (Karatepe 41ff.), nom. pl. *á-sù-wa-i* (cf. Lyc. *esbe-di* 'cavalry'), Laroche 1960:I.62. Mitannian Aryan *LÚa-aš-šu-uš-ša-an-ni* 'horse trainer' (equivalent to Skt. *ásvā-sani-* 'groom'), literally 'acquirer of horses', Kammenhuber 1961:6 et pass., Mayrhofer 1956:I.62. Skt. *ásva-*, Avest. *aspa-*, OPers. *asa-* 'horse', Sogd. *'sp-*, Wakhi *yaš*, Oss. *jæfs*. Gk. (Myc.) *i-qa* 'horse' (Ventris and Chadwick 1973:548, Morpurgo 1963:115); Hom. *híppos* 'horse' (with geminate *-pp-* from **-k̑h₂w-*, cf. I.2.3.2 above). Venetic *eku-* in the compound *ekuþeþaris*, apparently originally 'pertaining to a wheelwright', Pulgram 1976. Latin *equus* 'horse'. OIr. *ech*, Gaul. *epo-* 'horse' in names like *Epo-na* '*muliōnum dea*' 'goddess of coachmen', i.e. 'horse goddess' (Holder 1961-1962:I.1458ff.). OE *eoh* 'horse', OIcel. *jór*, Goth. *aiþva-* 'horse' (Feist 1923: 15). Toch. A *yuk*, B *yakwe* 'horse'.

Special feminine forms arise independently in some dialects: Skt. *ásvā*, Avest. *aspā-*, Lat. *equa*, Lith. *ešvā*, *ašvā* 'mare' (Fraenkel 1962-1965:I.20).¹

A number of dialects (in the Greco-Aryan group) attest ancient derivatives in **-yo-* from the root **ek̑h₂w-*: Gk. (Myc.) *i-qi-ja* 'chariot', Gk. *híppios* 'one who goes out on a chariot' (of a god) (Hom. *hippio-khármēs* 'warrior on a chariot'), cf. Myc. *i-qe-ja* 'pertaining to a horse' (Gk. *hippeía*), Skt. *ásviya-* id., Avest. *aspya-*.

Another ancient derivative, in *-n-*, appears in Lat. *equīnus* 'equine; pertaining

1. In two Indo-European dialects — Slavic and Armenian — there is no term for 'horse' from this root, which must mean that the original word was replaced by other terms. Traces of the ancient term can be found in Slavic toponyms such as *Osvica*, *Osveja*, *Osovka* (Toporov 1975:I.137). In Armenian, *ēš* 'donkey' is believed to reflect the Proto-Indo-European root for 'horse' (Watkins 1970; cf. further Toporov 1975:I.137, with references; Lamberterie 1978:262-66), while Arm. *ji*, gen. *jioy* 'horse' is compared to Vedic (poetic) *háya-* 'horse', which probably goes back to a descriptive derivation from **ǵhei-* (Pokorny 1959:424).

to horses' (cf. Umbr. *ekvine*), Lith. *ašvėnis* 'workhorse', OPruss. *aswinan* 'horse's milk; kumiss', Skt. (Ved.) *aśvín-* 'having horses'.

Also Proto-Indo-European may be several terms for body parts of horses, reconstructed on the evidence of a number of ancient dialects: Skt. *mányā* 'edge of horse's ear' (O'Flaherty 1978:476), Lat. *monile* 'mane', OHG *mana* 'mane' (Ger. *Mähne*, Engl. *mane*); a dialectally more restricted word for 'mane' can be reconstructed on the evidence of Skt. *grīvā* 'mane'; Common Slavic **grīvā* 'mane' (Russ. *griva*, Serbo-Cr. *grīva*, Cz. *hříva*, etc.).

3.1.1.2. *The role of the horse among the early Indo-Europeans. The horse in Old Hittite tradition. Its military, transport, cultic, and mythological role*

The special military-transport, ritual-cultic, and economic significance of the horse among the Indo-Europeans can be established on the evidence of the earliest sources for each of the early Indo-European traditions. The earliest mention of horses in texts of the ancient Indo-European languages is in the Anittas text of the early second millennium B.C., which enumerates warriors and horses (Sumerogram ANŠE.KUR.RAḪI.A, 70 Rs.) and discusses harnesses, evidently of horses (Giorgadze 1965:93, Neu 1974).²

The special ritual significance of horses in the Old Hittite tradition is clear both from the cultic and legal status of horses reflected in the Hittite Laws (discussed above, II.1.3.2) and from the traces of horse sacrifice reflected in Hittite rituals (e.g. KUB XXIX 56 11-12, where horses are mentioned in connection with sacrifice using the verb *šipant-* 'perform a sacrifice or ritual libation'). The Indo-European source of the Old Hittite conceptions connected with the horse cult are established by comparative analysis of the Old Hittite deity Pirwa, who is represented as riding on a horse (Otten 1951, Cornil and Lebrun 1972:13-14). Pirwa can be compared to deities who bear etymologically identical names and are connected with horse cults elsewhere in Indo-European.

The significance of the Old Hittite information pertaining to horses lies in the fact that it reflects a particular, chronologically identifiable layer in the military and cultic use of horses.

3.1.1.3. *Horsebreeding and the Mitannian Aryans*

A qualitatively new stage in the development of horsebreeding in ancient Asia

2. The Hittite reading of the Sumerogram ANŠE.KUR.RA 'horse' is unknown; however, the hieroglyphic Luwian form mentioned above testifies to the presence of the Indo-European word for 'horse' in Anatolian.

Minor arose in the middle of the second millennium B.C., when the Hittites became acquainted with the use of horses harnessed to lightweight two-wheeled military chariots. This way of using horses, and the training and care of such horses, were being practiced at that time in the Mitannian state to the east and southeast of the Hittite kingdom, along the upper Euphrates in northern Mesopotamia. A description of these horse-training methods is preserved in the famous Treatise of the Mitannian Kikkuli on the care of horses and a few other analogous texts (Kammenhuber 1961, 1968). This text uses a number of special terms, interpretable on the basis of Aryan, which testify to the extremely high level of horsemanship among the Aryans. Words interpreted as Aryan in this Hittite treatise include, in addition to *aššuššanni* 'groom' (cf. Skt. *aśvāsani*-) mentioned above, the following horse-training terms (Kammenhuber 1961, Mayrhofer 1966, 1974):

Compound terms designating uneven numbers of laps of horses in the stadium (*wašanna* 'racecourse'):³ *aika-wartanna* 'one lap': *nam-ma-aš* 20 IKU¹.A *a-i-ka-wa-ar-ta-an-na pār-ḫa-i* 'then (he) makes them (horses) run 20 fields in one lap' (KUB I 13 II 1, 17 and 22). The compound *aikawartanna* consists of *aika*- 'one' (cf. Skt. *éka*- beside Avest. *aēva*-, OPers. *aiva*- 'one') and *-wartanna* 'turn' (cf. Skt. *vártate* 'turns', Ved. *vartan-í*- 'track, path, rolling out', Grassmann 1873:1223; Oss. *æwwærdyn* 'train a horse', Bailey 1957:64);⁴ cf. the corresponding Hittite word in the same treatise: *waḫnuwar* 'turn', an infinitive from the verb *waḫnu*- 'turn'. *ter(a)-wartanna* 'three turns': cf. Skt. *tri*- in compounds (*tri-pád*- 'three-legged'), Avest. *θri*-, and Skt. *tráya*- in compound numbers (*tráyo-daśa*- '13', cf. Lat. *tredecim*), Avest. *θrayō*. The Mitannian Aryan form is closer to the form of Indo-Iranian compound numerals. *panza-wartanna* 'five turns': cf. Skt. *pāñca* 'five', Avest. *panča* 'five'. *šatta-wartanna* 'seven turns': cf. Skt. *saptá*, Avest. *hapta* 'seven'. *na-wartanna* 'nine turns': cf. Skt. *náva*, Avest. *nava* 'nine'. The Mitannian Aryan form is clearly from **nawa-wartanna*, with haplological loss of *-wa*-.⁵

3. The form *wašanna* 'racecourse' is itself of Aryan origin: cf. Sogd. 'n^rxr-wzn 'ring of the zodiac; path (wazana) of the stars' (Benveniste 1962a:9), Skt. *vāhana*- 'animal (which the gods ride)', OE *wægn*, Engl. *wagon*, Ger. *Wagen*, PIE **wegh*-.

4. The structurally identical Sanskrit compound *ekavṛt*- is used in the somewhat different sense 'single, only' (in the Atharvaveda); but cf. Skt. *āvarta*- 'lock of a horse's mane' (O'Flaherty 1978:476). An exact correspondent to the Mitannian Aryan term can be found in Old Iranian **Varta-aspa*- 'trainer (literally 'turner') of horses' (in Akkadian cuneiform rendered as *Ú-mar-ta-as-pa*-. Zadok 1975:247). Also attested in Old Iranian (Avestan, *Yašt* 5, 50) is the expression *nava frādwərəsāma razurəm* 'a forest of nine circles (i.e. in size)' in connection with a description of a race or contest on horse-drawn carts (Hauschild 1959), which coincides exactly with the Mitannian Aryan horse term *na-wartanna* 'nine turns', discussed below.

5. The analysis of these Mitannian Aryan forms gives us the possibility of determining with some approximation which Aryan dialect they reflect. It is obviously a separate Indo-Iranian dialect, attested only in these and similar fragments in cuneiform texts written in other languages. It is a dialect where diphthongs have not yet monophthongized: cf. *-ai-* in *aika*- 'one': Skt. *eka*- 'one', OPers. *aiva*-. On the other hand, it shows assimilation of *-pt-* to *-it-*: cf. *šatta*- 'seven'

Judging by the horse-training treatise and other evidence, the Aryan dialect reconstructible from these fragments was the language of oral communication for the Mitannians of the relevant social stratum. This can be seen from the parallel use and juxtaposition of Hittite and Aryan words, e.g. the Hittite-Aryan hybrid form *anda wart-* 'make a turn' and others. Meanwhile, the language of the mass of the population of the Mitannian state was Hurrian, a non-Indo-European language already known from other areas of the Near East long before the formation of the Mitannian kingdom (Laroche 1978). However, given the advanced horse-raising culture in the Mitannian kingdom, a culture subsequently transmitted to the Hittites, we must assume that this culture was brought in specifically by the Aryan element of the Mitannian kingdom, as is reflected in the predominantly Aryan nature of the Mitannian horse-training terminology.⁶ Prior to the formation of the Mitannian kingdom, the Hurrians themselves made little use of horses, either military or economic. Moreover, in the Hurrian tradition the main transport animals were bulls: in the Hurrian poem 'The song of Ullikummi' the Thundergod, preparing for battle, harnesses bulls to his carriage. Even in late Hurrian cultic representations of the early first millennium, the Thundergod is shown standing on a light cart to which a bull is harnessed (gold vessel from Hasanlu, early first millennium B.C.: Haas 1975:92).

In contrast to the strictly Hurrian data, all the ancient evidence concerning the early Indo-Iranian traditions speaks for the exceptional cultic and military-economic significance of horses.

beside Skt. *saptá*, Avest. *hapta*. Only in the Middle Indic period do we find analogous assimilation of consonant clusters. This dialect shares with Iranian its reflex of the Indo-European palatal *ǵh₁: corresponding to Sanskrit *-h-*, Mitannian Aryan shows an assimilated phoneme rendered as *s*, which links it with Iranian, where this consonant is reflected by *z*: cf. Mitannian Aryan *wašanna* 'racecourse' beside cognate Skt. *vāhana-*, Sogd. *wzn*. It is interesting that several of the attested Mitannian Aryan words are semantically closer to their Iranian cognates than to the Indic ones: e.g. *wašanna* and Sogd. *-wzn*; *-wartanna* and Oss. *æwwærdyn*.

Thus the Mitannian Aryan dialect does not coincide with any of the historically attested Indo-Iranian dialects and, judging from just these fragmentary pieces of information, can be reconstructed as a separate Aryan (Indo-Iranian) dialect with distinct reflexes of Common Aryan forms. It can therefore be maintained that by the middle of the second millennium B.C. separate dialects had formed within Indo-Iranian; one of them is reflected in the Mitannian Aryan linguistic fragments.

6. An Aryan element in the Mitannian culture is further attested by the Mitannian pantheon, which has as its major royal deities gods with Aryan names: *Miuraššil*, *Uruwanaššil*, *Indara*, *Našatiyanna*. These names, which have Hurrian endings, can be identified with the ancient Indo-Iranian pantheon reflected in Vedic respectively by *Miūrā-Vāruṇa-*, *Índra-*, *Násatyā* (the Divine Twins, the Ashvins), see Dumézil 1961. Further evidence is a number of personal names, including royal names and those of the social stratum *maryannu* (also interpreted on the basis of Aryan: Skt. *mārya-* 'young man; young hero'; see below): such names include *Matiwaza* beside Skt. *-māthi-* 'destroying' (in compounds in the Rgveda) and *vāja-* 'force' (also in the Rgveda as the second element of compounds such as *citrā-vāja-* 'having exceptional force'), which points to a compound **mathi-vāja-* 'having destructive force'; *Tušratta* beside Skt. *tveṣā-ratha-* 'whose chariot rushes ahead', etc., see Mayrhofer 1966, 1974.

3.1.1.4. Horses in the ancient Indo-European tradition. The horse cult in the Rigveda and the Ashvins

As early as the Rigveda, the horse is one of the basic sacred animals. It is associated with the divine twins, the Ashvins, who, among other things, heal and care for horses (Dumézil 1966:278). The Ashvins travel on carts harnessed with horses:

*arvān tricakró madhuvāhano rátho jīráśvo áśvínor yātu súṣṭutaḥ
trivandhuró maghāvā viśvásaubhagaḥ śám na ā vakṣad dvipáde
cātuṣpade* (I, 157, 3)

‘May the three-wheeled car of the Áświns, drawn by swift horses,
laden with honey,
Three-canopied, filled with treasure, and in every way
auspicious, come to our presence, and bring prosperity
to our people and our cattle’

(H. Wilson 1854:100-101)

In the Rigveda, together with hymns to the sun there are a few hymns to apotheosized horses which are cited by name (IV, 38-40; VII, 44; X, 178). The divine horse Etaśa is described in the Rigveda as ‘drawing the chariot of the Sun’. Of particular interest is the Vedic funeral hymn to a horse (X, 56), which is followed by a hymn to ‘heavenly horses’, a hymn in praise of the apotheosized horse, winner of races.

The ancient Indo-European horse cult, revealed in the ritual of horse sacrifice (cf. II.1.3.2 above), appears in the earliest rites, which are the subject of hymns in the Rigveda (I, 162-63), see Puhvel 1970a. These hymns to a horse sacrificed at the horse pillar (*áśvayūpá-*, I, 162, 6) name the earliest gods of the Vedic pantheon, beginning with Mitra, Varuna, and Indra (I, 162, 1).⁷ The ritual pillar *áśvayūpá-* is functionally identical to the Cosmic Tree, Skt. *áśvatthá-*, literally ‘horse tree’. This name reflects the ancient conception of the Cosmic Tree as having a horse tethered to it; cf. the analogous name for the Cosmic Tree in the Edda: *Ygg-drasill*, literally ‘place where Odin’s horse is tied’, elsewhere also *askr Ygg-drasils* ‘ash (tree) of Odin’s horse’, Sternberg 1936:118, de Vries 1957:II.380ff. Thus the ritual horse, the Cosmic Tree with a horse tethered to it, and deities — the divine twins, protectors of horses and the Cosmic Tree — form a complex of ritual and mythological conceptions, inherited by Sanskrit religion from Proto-Indo-European religion.

7. Cf. in the later archaic ritual text *Śatapatha-Brāhmaṇa* (4.2.1.11ff.): *sa hi vāruṇo yad áśvaḥ* ‘the horse is Varuna’s’ (literally ‘is that which is of Varuna’).

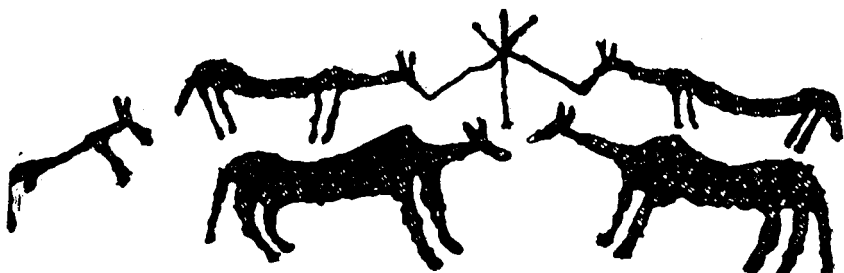


Illustration 6.

Horses at the Cosmic Tree. Minusinsk ravine, southwestern Siberia

3.1.1.5. *The horse in Old Iranian tradition and its ritual significance*

In the Old Iranian tradition, the ritual significance of horses is evident primarily in rites of horse sacrifice, analogous to the Sanskrit rites and reconstructed from written documents and archeological data (cf. II.1.3.2 above). The ancient rite of horse sacrifice was preserved until recently in the descendants of Scythian traditions, cf. the Ossetic ritual of dedicating a horse to a deceased person, *bæxfældīsyn* (Abaev 1958:I.435). Ossetic also preserves the ancient horse-breeding term *æwwærdyn* 'horse training' (cf. above on the Mitannian Aryan cognate *-wartanna*).

Evidence for the great significance of horses in the Old Iranian tradition is the unusually high frequency of Old and Middle Iranian names of rulers containing the root *aspa-* 'horse': *Asparuk* (in Greek rendition, *Aspauroúkis*) in Georgia, second to third centuries A.D. (Cereteli 1941); Arm. *Aspūrak* (Justi 1895:47), Turco-Bulg. *Asparuk* (Abaev 1949:I.157), literally 'light-colored horse' or 'having light-colored horses', from OIran. **aspa-* and **rauk-* 'light, light-colored'; *Āspakos*, *Išpakai*, a Scythian prince (Vasmer 1923:I.14, 34); *Banádaspos*, king of the Iazyges, a Sarmatian tribe, OIran. **vanat-aspa-* 'victory-horsed', from *van-* 'conquer' (Vasmer 1923:I.35); **Ašta-aspa-* (Gk. *Astáspēs*) 'having eight horses', **Vista-aspa-* (OPers. *Vīštāspa-*), Mayrhofer 1979:I.25, I.97 et pass.

3.1.1.6. *Horses in Ancient Greek tradition. The ritual and mythological role of horses*

In ancient Greek tradition as reflected as early as the Mycenaean texts, the horse is a ritually significant animal whose cult is symbolized by a special female

deity, whose name in Mycenaean is *po-ti-ni-ja i-qe-ja*, literally 'lady of horses' (*Potniāi hiqweiai* = Class. Gk. *Potniāi hippeiai* [dat.]: Lejeune 1958, cf. Ventris and Chadwick 1973:483, 548). In the Balkans, in modern Croatia, a Mycenaean representation of a female deity seated on a horse was found (Levi 1951, fig. 4a).⁸

Also connected with horses is the Mycenaean word for 'chariot', *i-qi-ja* (Gk. *hippios*, cf. Hom. *hippio-kharmēs* 'warrior on a chariot'), which points to the uses of horses as harness animals for lightweight military chariots; horses (usually two) harnessed to lightweight military chariots are a favorite motif of Mycenaean art and are especially frequent on the bas-relief tombstones of Mycenaean kings. Use of wheeled carts for transportation of merchandise and food was also characteristic of the Mycenaean period.

Archeological evidence testifies to relics of the Indo-European funeral rite of horse sacrifice among the Mycenaean Greeks: a horse skeleton was found in a burial vault in the Pronoia necropolis (Blavatskaja 1966:80n37, 1976:96). This is consistent with the existence of Mycenaean personal names formed from *i-qo* 'horse' (cf. the later Greek names of the same type: Lejeune 1958:289).

The high development of horsebreeding in Mycenaean Greece is revealed by special terms for 'young horse', 'colt', 'foal': Myc. *po-ro* (Gk. *pōloi*) 'colts', corresponding regularly to Goth. *fula*, OIcel. *foli*, OE *fola* (Engl. *foal*), OHG *folo* (Ger. *Fohlen, Füllen*) 'foal', Alb. *pëlë* 'mare'.

Horses and the related complex of ritual and cultic concepts in the Creto-Mycenaean cultural area are associated specifically with the Indo-European Greek ethnic element. Horses and horse cults were absent on Crete until the middle of the second millennium B.C.; prior to this time the bull was the sacred and cult animal. The appearance of horses on Crete dates from the Late Mycenaean period, i.e. the time when the Greeks first appeared on the island. One of the Cretan seals of this period depicts a horse loaded onto a ship (Pendlebury 1939:221).

Homer preserves archaic formulas comparing a swift horse to a bird and coinciding etymologically with Indo-Iranian formulas: e.g. *ōkéēs híppoi* 'swift horses' (11 times in Homer) beside Ved. *āśvā āśávaḥ* 'swift horses' (*āśúm āśvam*, Rigveda I, 117, 9; VII, 71, 5), Avest. *āsu.aspa-* 'owning swift horses' (see Schmitt 1967:§493ff.).⁹

8. This Mycenaean depiction of a deity on horseback and Mycenaean statuettes of horsemen (Blavatskaja 1966:80) are among the earliest iconographic attestations of horseriding. In this connection it is of further interest that the Hittite horse-riding deity Pirwa is identified in the Late Hittite period with the Hurrian Ishtar — an androgynous deity on horseback (Cornil and Lebrun 1972:13-14). These female models of a deity on horseback can be regarded as prototypes for the horseback-riding Amazons of Greek mythology, whom tradition associated with Asia Minor (Leonhard 1911).

9. Cf. the Venetic reflex of the image of horse as bird in the compound *ekvopetaris*, identifiable with Skt. *āśvapātara-* 'flying horse' (literally 'horse-flying'), Prosdocimi 1972:222. Cf. also the image, frequent in the Rigveda, of eagles harnessed to carts and hence equated to

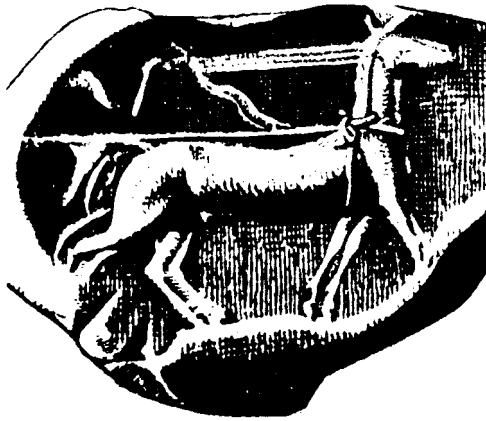


Illustration 7.

Minoan seal showing a harnessed horse. Hagia Triada, Crete,
2nd millennium B.C.

In classical Greek tradition, beside the preservation of traces of former mythic conceptions of the horse as a sacred animal, inherited from the Mycenaean period, we find a new use of the horse for riding (attested by the early classical period: Greenhalgh 1973:45, 46, 53ff., Hill 1974), and later in agriculture for plowing (first millennium B.C.).

3.1.1.7. *Traces of the horse cult in Roman tradition*

In Roman tradition the ancient Indo-European rite of horse sacrifice is preserved in all its essential details, which coincide with the Sanskrit ritual of the Ashvamedha. In Rome an annual *Equus October* rite was performed, during which a sacred horse — the right-hand one of a harnessed pair (Lat. *bīgae*) which had won a horserace — was slaughtered and its body cut into pieces (as in the Ashvamedha).¹⁰ Its tail was brought to the wall of the Regia sanctuary, whose very name shows the originally royal character of the festival (the horse sacrifice was of a similar nature in the Indic and Iranian tradition). The Latin name of the festival, based on its calendar timing, coincides with the Sanskrit name of a month (September to October) *āśvayuja-* ‘month of the Ashvins’ (literally ‘month of harnessed horse team’; Skt. *yuj-* ‘harness’ is cognate to Lat. *bīgae* ‘harnessed pair’). The Latin rite was dedicated to the god of war Mars, in ancient times the protector of new settlements and the appropriation of new lands (Dumézil 1966:211, 217-25).

horses. Also typologically relevant here is the Urartean horse name ‘eagle’, cf. II.2.3.1.4 above.

10. By the classical Roman period, charioteers were no longer a basic part of the army; they had been replaced by horseback riders who constituted a new type of troops — the cavalry.

The horse cult was also connected with the social structure of ancient Rome, where there was a special social stratum of horsemen, the *equites*, whose ritual leader was the *magister equitum* 'leader of horsemen'. During the annual ritual of *transuectio equitum* 'parade and review', a sacrifice was performed to one of the divine twin brothers, who by now bore the Greek name Castor (Dumézil 1966:401-2) and is comparable to the Ashvins.

3.1.1.8. *The horse in Celtic tradition*

An ancient Indo-European ritual in which the king is symbolically wedded to a sacrificed horse is preserved in the Celtic tradition (see II.1.3.2 above). The ritual closeness of horse and man is symbolized in Gaulish representations of horses with human heads, which corresponds to the Old Irish myth of the magic horse which avenges its master (Sjoestedt-Jonval 1936:36-38).

In Gaulish tradition an important cultic role of horses is apparent in the goddess *Epona*, whose name is etymologically related to the Indo-European term for 'horse' and who was considered the 'goddess of coachmen', *mulīonum dea*. It is also noteworthy that in the Gaulish calendar there was a month named for the horse (*EQUOS*) (see de Vries 1961:123ff.).

Together with the original Indo-European term for 'horse' (OIr. *ech*, Gaul. *epo-*), Celtic attests another word with the same meaning: OIr. *marc*, Welsh *march* 'horse', probably Gaulish *márkan* (the Celtic term for 'horse' according to Pausanias, X 19.11), which has cognates in the Germanic languages: OIcel. *marr* 'horse', *merr* 'mare', OHG *mar(i)ha* (Ger. *Mähre*), OE *meaerh* 'horse' (Engl. *mare*); for these terms see below.

3.1.1.9. *The horse cult in Germanic tradition*

In the Germanic tradition, the cultic role of the horse is revealed in many archaisms of Indo-European origin. In addition to the manifestations of a horse cult in connection with burial rites (mentioned above, II.1.3.2) and the archaic name for the Cosmic Tree *Yggdrasill* (literally 'pillar of Odin's horse'), the myth of two royal brothers with the horse names Hengist and Horsa, who, according to legend, led the Anglo-Saxon invasion of Britain, is of particular interest. These same two names were preserved in Schleswig-Holstein until the nineteenth century, as ritual names for carved horse heads on the roofs of houses (Ward 1968:54). Legend connected the royal brothers Hengist and Horsa with the rite of the White Horse, which was thought to embody "all cattle"; the rite was preserved until the nineteenth century (Woolner 1967).

As in the Iranian and Greek tradition, old Germanic personal names contain

the word for 'horse', e.g. OE *Frid-hengest* (comparable to Mitannian Aryan names like *Biridašua*, *Biriyaššuwa*, see Schmitt 1967:244).

3.1.1.10. The old Germanic terms for 'horse'

Together with the ancient name for 'horse' (Goth. *aiha-*, OIcel. *jór*, OE *eoh* 'horse'), Germanic displays a number of innovations designating varieties of this animal. The clearest examples are OHG *hengist* 'horse', 'equus' (Ger. *Hengst*), OE *hengest*, OIcel. *hestr* 'horse' and OHG *hros* (Ger. *Ross*), OE *hors* (Engl. *horse*), OIcel. *hross* 'horse'. Later innovations in German include *Pferd* 'horse', going back via Medieval Lat. *paraverēdus* 'post horse' to a posited Celtic source (Paul 1956:II.453), and *Stute* 'mare', whose original meaning was 'herd of horses': cf. OHG *stuot* beside OE *stōd* 'place for breeding horses; stud farm' (Engl. *stud* 'herd of animals, especially horses', cf. Russ. *stado* 'herd, flock': PIE **sthā-*).

3.1.1.11. The Celto-Germanic term for 'horse' and its Asiatic sources

There is a distinctive set of Germanic terms for 'horse' (OIcel. *marr* 'horse', *merr* 'mare', OHG *marah* 'horse',¹¹ *mariha* 'mare', OE *mearh* 'horse', *mīgre* 'mare'),¹² with Celtic cognates (OIr. *marc*, Welsh *march*, Gaulish *mārkān* 'horse'). A Celto-Germanic protoform for these attested words can be posited in the form **markho-* (Pokorny 1959:700). The word has no cognates elsewhere in Indo-European and must be considered a loan¹³ into the Celto-Germanic dialect group from some eastern Asiatic source.

This term for 'horse' is found throughout the Central Asian and East Asian linguistic area and is the basic term for 'horse' in many languages of Eurasia. In Altaic (specifically, in Mongolian, the Tungusic family, and Korean) it appears in the form **mor-* (Mong. *morin*, Tungusic *murin*, Korean *mal*:

11. This is the source of OHG *marah-scalc* 'one who takes care of horses; groom', which provides OFr. *mareschal* 'groom; marshal', Fr. *maréchal*.

12. In the ancient Germanic dialects these terms for 'horse' evidently had specialized senses (perhaps 'riding horse') and coexisted with the old Indo-European terms, Goth. *aiha-*, OE *eoh*, OIcel. *jór* < **ehwaR*. This older term for 'horse' was used in Germanic as the name of one of the runes, 'eoh' (M), cf. the Old English rune M with the phonetic value *e* and the reading *eoh* in rendering the name of the poet Cynewulf (ninth century A.D.). That the rune M, obviously borrowed from the Latin alphabet where it had the phonetic value *m*, had a Germanic reading *e*, *eoh*, can be explained if we posit a parallel Germanic word for 'horse' with an initial *m-*. This is a symbolic renaming of the rune 'horse' **markhos* > **marhaR* by means of the semantic equivalent **ehwaR*, which began with another sound, namely *e-*, which was then ascribed to the rune (on symbolic runes see Makaev 1965:62-64).

13. The word has been claimed to be a loan by Meillet (1952:153).

Polivanov 1968:63, 167, 168), which may have had a diminutive **mor-qa* (Ramstedt 1946-1947:25) or **morkin* (see Novikova 1979:67ff.). In another East Asian group of languages, Sino-Tibetan, the word has the form **mraŋ*, whence Chin. *mǎ* from **mra* (cf. Jap. *uma* > *uma*), OBurm. *mraŋ*, OTib. *rmang* < **mraŋ* (Polivanov 1960, Coblin 1974), cf. Tamil *mā* and others in Dravidian (Burrow and Emeneau 1961:318).

The word is plainly a migratory term which spread throughout the languages of Central and East Asia, whence it could have entered the Celto-Germanic dialects. The inherited Indo-European **ek̑h₂wos* was used to denote a harnessed horse in these languages, whereas the borrowed Oriental word **markho-* in all probability referred to a riding horse.

Horseback riding became known in the areas of historical Celtic and Germanic settlement only around the first millennium B.C. (Clark 1952:301-15). The words for 'horse' point clearly to contacts of the Celto-Germanic groups with speakers of Asian languages before the first millennium B.C., which could have occurred during the historical migrations of the tribes speaking Celto-Germanic dialects.¹⁴

3.1.1.12. *The horse cult among the ancient Balts*

A horse cult in many ways analogous to those just discussed is also found in the Baltic tradition. The Balts had a special god of horses (*equorum deus*) with various names and epithets, as well as a ritual of horse burial and ritual horse races during funerals. An indirect trace of horse sacrifice in Baltic can be seen in the custom of drinking 'horse's blood' together with 'mare's milk' (Toporov 1975-I.136). The Divine Twins, called 'sons of God' (Lith. *Diēvo sūnēliai*) in Baltic as in Greek, are constantly associated with two horses, which are often used as ornaments on the roofs of houses; cf. the analogous custom in Germanic tradition and the connection with the horse of the Greek Dioscuri (Gk. *Dioskoúroi* 'sons of the Sky God', Ward 1968). Baltic preserves several ancient words connected with the Indo-European name for 'horse' (Lith. *ašvā* 'mare', *ašvėnis* 'work horse', OPruss. *aswinan* 'mare's milk') and hydronyms derived (as in Sanskrit and other traditions, Porzig 1964:303-4) from the same root (e.g. Lith. dial. *Ašvā*, river name, and others: Fraenkel 1962-1965:I.20); but even by Common Baltic times new words for 'horse' and varieties of horses had arisen: OPruss. *sirgis* 'mare', Lith. *žirgas* 'horse', Latv. *ziņgs* 'horse'; Lith. *arklỹs* 'horse', Latv. *ārkls* 'horse'. The latter word is formed from the identical word for 'plow' (Lith. *ārklas* '(wooden) plow', Latv. *ārkls* '(metal) plow', Mühlēn-

14. The fact that this Celto-Germanic borrowing from an East Asiatic language can be dated to the first millennium B.C. (see also Novikova 1979:67ff.) rules out the possibility that it was borrowed from Hunnic; the Huns spread into Europe only in the first centuries A.D.

bach and Endzelin 1923-1932:I.141), which points to the use of horses for plowing (cf. the use of horses in agricultural labor in classical Greece and other late Indo-European cultures).

3.1.1.13. *The horse in Slavic tradition. Slavic terms for 'horse'*

In the Slavic tradition, the cultic role of the horse is reflected most clearly in medieval data about the Baltic Slavs, who preserved paganism longer than the other Slavs. Each of the three major gods of the Baltic Slavs was characterized by its own sacred horse of a particular color. Sacred horses also figured in fortunetelling (Ivanov and Toporov 1965:32-45 and Table 2). In an East Slavic sacrificial altar of the ninth century A.D. dedicated to the Slavic 'Thundergod on horseback' Perun (the site is at Peryn', near Novgorod), who is etymologically and functionally identical to the Hittite god on horseback Pirwa, the remains of a sacrificed horse were found (Sedov 1953). In the same area and in approximately the same century (prior to the eleventh century A.D.) we find horse sacrifice as part of a building rite, accompanied by the erection of two horse figurines at the peak of the roof (as in the Baltic and Germanic traditions): Mironova 1967. Slavic folklore preserves numerous echoes of ancient beliefs in horses as sacred animals (Ivanov and Toporov 1974:340 et pass.).

While they preserve rites and mythological motifs reflecting the ancient Indo-European horse cult and the complex of notions associated with it, the Slavic languages have completely lost the Indo-European word for 'horse', replacing it with new lexical formations (see Trubačev 1960:47ff.): OCS *konjī* 'híppos', 'horse', ORuss. *kon'* 'horse', *komon'* 'war horse'; OCS *kobyła* 'híppos', 'mare', Russ. *kobyła* (a migratory term, reflected in Gallo-Latin *caballus* 'horse', Gk. *kabállēs* (Hesychius), and a number of Asiatic languages: OTurk. *kevāl*, *kevil* 'racehorse', Pers. *kaval* 'fast horse'). Among the later borrowings from Asiatic languages into separate Slavic languages are Russ. *lošad* 'horse', dial. *lošá* 'foal', from Tk. (a) *laša* 'horse; gelding' (Dmitriev 1962:540), Russ. *merin*, ORuss. *merin*" (from 1500 A.D.) from Mong. *morin*; and others.

3.1.1.14. *The ancient Balkan term for 'horse'*

In a group of ancient Balkan Indo-European dialects, words for 'horse' or 'foal' are areal innovations, evidently derived from a base meaning 'breastfeed; suck' (Alb. *měnt* 'suck; breastfeed', OHG *manzon* 'udder', cf. Bret. *menn* 'young animal', Pokorny 1959:729); Alb. *mēs* 'foal', 'donkey foal', Illyr. *mandos* 'small horse', Lat. *mannus* 'small Gaulish horse', Messap. *Iuppiter Menzanas* 'god to whom horses were sacrificed'. The word is borrowed into other Balkan and

Mediterranean languages: Rum. *mînz* 'foal', Ger. (Tyrol. dial.) *Menz* 'dry cow', Basque *mando* 'mule', see Solta 1974:57.

3.1.1.15. *The role of horses among the ancient Indo-Europeans*

Comparison of the ancient Indo-European traditions associated with the horse cult and the use of horses in transport and for military purposes allows us to reconstruct the presence of domesticated horses for Proto-Indo-European. They were designated by the term **eḱʰwos*, which had great cultic significance (horses were sacrificed and were associated with gods, including the Divine Twins, and with the Cosmic Tree), and were also used as harness animals for carts and war chariots. Only in the more recent traditions do we find wide use of horses for horseback riding in war and transport; for the archaic period, horseback riding can be posited only as a means of horsebreaking, including taming wild horses.

3.1.1.16. *The domestication of the horse; its wild ancestors*

The domestic horse (*Equus caballus* L.) and all the early varieties in which it is known in the Old World must be descended from one single species of wild horse. Several types of wild horses are known: large horses with massive skeletons and wide hoofs, found primarily near the glacial zone of Europe, and several types of smaller, less massive wild horses found far from the glacial zone in eastern Europe and in Asia (Gromova 1949, Azzaroli 1966). One of these smaller types of horses, whose size was more appropriate for domestication, must have been the ancestor of the domestic horse.

The Przewalski horse (*Equus przewalskii*), found in Central and Eastern Asia and surviving to this day in scattered groups near the Gobi desert in Mongolia, cannot have been that ancestor because, according to recent data, it differs genetically from the domestic horse (the Przewalski horse has 66 pairs of chromosomes while the domestic horse has 64). Hence the original area of the Przewalski horse is ruled out as the center of domestication of the horse. Further evidence against an Asian center of domestication is the lack of domesticated horses in eastern Asia, in particular in China, until the Yin period, at which point the horse is introduced from the west, evidently under West Asiatic cultural influence (L. Vasil'ev 1976:278-79).¹⁵

15. These new facts undermine the earlier view (Polivanov 1968) according to which a horse domesticated from the Przewalski horse was called **mor-* in the Altaic languages, from which the word was borrowed into Chinese and other South Asian languages. The term **mor-* must have originally referred to the same domesticated horse known further west, and not to one descended from the Przewalski horse; consequently, the domesticated horse entered Central Asia from the west.

The remaining types of equids, close to wild horses and possible ancestors of the domestic horse, include several biologically close species: the tarpan (*Equus gmelini*), found in Europe north of the Black Sea between the Dnieper and the Volga, which survived until the nineteenth century (Berg 1955:136, Bibikova 1967, Nobis 1955, 1971);¹⁶ and the European wild horse, extinct since the eighteenth century (see Drower 1969, Bökönyi 1974). These possible ancestral horses are distinct from the onager (*Equus hemionus onager* Bodd.), which was used as a draft animal in very early times (Noble 1969). The onager was found in the broad steppe zone north of Mesopotamia (Jarmo, ca. seventh millennium B.C., see Berger and Protsch 1973:225), including Asia Minor and the Transcaucasus (Zeuner 1963).¹⁷

It is not clear whether the horse remains found at Anau in southwest Turkmenia (ca. 4800 B.C.; for further discussion see Kuz'mina 1976:151, Matolcsi 1973) belong to onagers or wild horses. If the Anau bones could be shown to be close to ancestral domestic horses, then Central Asia would have to be considered the area of first domestication of the horse (cf. Harlan 1976:92); from there the domestic horse could have entered the easternmost regions of Europe. It is noteworthy that clear evidence of developed horsebreeding is first found precisely in the most eastern region, to the east of the Dnieper (Bibikova 1969).

The earliest evidence for the cultural use of horses — specifically domestic horses, to judge from osteological data — was recently found in burial grounds in the lower Volga region; radiocarbon dating for one burial ground (Lipovyy Ovrage, Xvalynsk district, Saratov province) places it at the end of the fifth millennium B.C. (E. N. Černyx, p.c.). Specifically, horses were used for sacrifice (as shown by a find of two horse skulls on a sacrificial floor next to a burial in the burial ground at S'ezžee), and there was a horse cult (shown by bone carvings of horses in the Xvalynsk burial ground). This Lower Volga culture shows close links — in particular, in its sacrificial floors with animal skulls — with the more southern Caspian areas (Vasil'ev 1979).

3.1.1.17. The area of first domestication of the horse

In principle, these eastern European areas — the range of the tarpan — can be

16. The chromosome count of the tarpan, which became extinct in the last century, is of course unknown, and therefore it is impossible to precisely determine its relation to the domestic horse (*Equus caballus*): see Kuz'mina 1976:150.

17. Traces of the wild horse (*Equus ferus*) are found in the Transcaucasus, in particular at the Mesolithic site of Barmaksyz on the Calka plateau in Georgia, where the wild horse was the most important hunted animal (Kuftin 1941:123, Munčaeu 1973:73).

considered the area of first domestication of the horse.¹⁸ It is no accident that we find the earliest traces of the domestic horse precisely in these ranges of the wild horse. The earliest find of domestic horses in the northern Black Sea area dates to the second half of the fourth millennium B.C. (the village Dereivka on the right bank of the Dnieper: Bibikova 1967:113; cf. Kovalevskaja 1977:19, Bökönyi 1974:238). This territory later yields a significant quantity of domestic horse bones,¹⁹ both in the eastern area from the Don to the trans-Volga region (where the quantity of horse bones is significantly greater) and in the western area (Bibikova 1967). In this connection it is significant that bones of the wild horse *Equus caballus Missii*, which may be the ancestor of this type of domesticated horse, are found much farther east, in the Volga steppes (see Bibikova 1969).

In the southern Near East the domesticated horse is attested for the fourth millennium B.C. in culture sites in Mesopotamia, Elam (Susa), and adjacent areas of ancient Iran, where ancient horses are depicted on vases and statuettes from Hafaj, near Baghdad (Wiesner 1939, Hermes 1936a, 1936b, Potratz 1938, Hančar 1955; for the chronology of the appearance of horses in the Near East in the third millennium B.C. see also Thomas 1970:260, Kuz'mina 1974, 1976a, 1977).

An analogous picture can be reconstructed for Asia Minor at an even earlier period. Domesticated horse bones were recently found at Demirci Hüyük, Yarikkaya, and Norşun-Tepe in eastern Anatolia. They are found in Bronze Age strata as early as the second half of the fourth millennium B.C. (see Bökönyi 1978:54, Zarins 1979:60, Piggott 1979:10, Mellaart 1981).

The earliest written evidence for horses in Asia Minor is found in Old Assyrian tablets from Kültepe (*kārum Kaniš*), which make frequent mention of *rabī sisē* 'chiefs in charge of the horses' and also sometimes mention the use of horses (*sisā'um*) for transport (see Kammenhuber 1961:13).

The fact that the ancient evidence for the appearance of domesticated horses in these possible areas of domestication is simultaneous makes it less likely that independent parallel domestications took place. We are dealing with rapid diffusion of this novelty from one area to another. The paths of diffusion may have been the Balkans, where the horse is attested on the Danube in the third millennium (see Semenov 1974:294), and the Transcaucasus, where traces of horses are found by the very beginning of the third millennium in Kvacxelebi (see Kušnareva and Čubinišvili 1970:110; for horses in the Transcaucasus and

18. There is one more site where wild or domestic horses appear early: Bavaria, in southern Germany, ca. 3670 B.C.: Berger and Protsch 1973:222.

19. Paleozoologists find it difficult to distinguish the bones of domestic horses from those of their wild ancestors, especially at the early stages of domestication. In particular, in finds in the southern Ukraine and in Bavaria it is not always clear whether the bones are those of wild or domestic horses (Matolcsi 1973, Kuz'mina 1976), which makes it difficult to decide the question of just where the horse was domesticated and the species *Equus caballus* first appeared.

Caucasus see also Mežlumjan 1965). Another path of diffusion may have been to the east of the Caspian Sea via southern Turkmenia, where iconographic evidence for horses is found from the fourth millennium (Sarianidi 1973:113), although horses become frequent in this area only in the second to first millennia B.C., after a period when the camel reigned supreme as the basic means of transportation (see Calkin 1970:155-56, Masson 1976:437, 447).

Even investigators who maintain that the horse was domesticated in more than one place consider southwestern Asia to have been one of the centers, from which the horse could have penetrated into Central Europe.

In several of the ancient eastern civilizations located in the area where wild horses may have been domesticated, the domesticated horse was nonetheless an innovation introduced from another culture. This is shown, among other things, in the ancient Sumerian appellation of the horse as 'mountain donkey' (ANŠE.KUR.RA), which indicates that horses were imported from mountainous regions.²⁰

3.1.1.18. Indo-European and Near Eastern horse names

The culture-historical and linguistic facts about horses and their domestication give us some grounds for attributing the domestication to the Indo-European ethnic group — the tribes speaking Indo-European dialects. All known ancient names for 'horse' in languages historically spoken in the area of possible domestication of the horse are connected in one way or another with PIE **ēkʰwo-* 'horse'. Some ancient Near Eastern terms for 'horse' — e.g. Hurr. *ešši, iššiya-* 'horse' (Ottén 1953a:25, Goetze 1962a:35, Laroche 1978:85), Akkad. *sisu* 'horse' < *sisāum* (cf. the spelling ANŠE.ZI.ZI, possibly to be read in certain contexts as ANŠE₃*śi-śi*, in documents from southern Mesopotamia in the third dynasty of Ur, at the end of the third millennium B.C.: Civil 1966), Ugarit. *ssw*, Aram. *sūsyā*, Hebr. *sūs* 'horse' (Gesenius 1968:692), Egypt. *śśm.t* 'horse' (Erman and Grapow 1955:IV.276) — can be compared to PIE **ēkʰwo-* (see von Soden 1972:II.1051).²¹ Certain Caucasian words for 'horse' and terms connected with horses may belong here: e.g. Abkhaz and Ubykh *(a)čy* 'horse', Avar and Lak *ču*,

20. That ancient Mesopotamia is one possible area of horse domestication follows from the fact that traces of horses going back to the seventh millennium B.C. are found in this area. Similar remains found in Paleolithic caves in Palestine evidently are those of wild horses (Kovalevskaja 1977:18).

21. Akkad. *sisū* (and Sum. *śi.śi?*), Hebr. *sūs*, and Egypt. *śśm.t* may be reduplicated forms of the Indo-European root where the **kʰ* has already been assimilated. Another, although highly problematical, way to formally relate the Indo-European and non-Indo-European forms would be to posit PIE **sekʰwo-*, with an initial palatal sibilant (cf. the similar protoform given in Goetze 1962a:35). This initial **s* is lost in the majority of Indo-European dialects (cf. I.2.4.2 above), while in Greek *ἵππος* a trace of it can be seen in the initial aspiration (*spiritus asper*).

Akhvakh *ičwa* 'horse', and also Georg. *aču* (a word for urging horses on), *ačua* 'horse' (children's word).

The wide distribution among various Near Eastern languages of resemblant forms for 'horse' is grounds for considering the word a migratory term. The source of these migratory forms may have been dialects of Proto-Indo-European in which **k̑h* had been assibilated — either *satem* dialects or dialects like Anatolian, in which assibilation is contextually conditioned by position before *-u-* (see I.2.3.2 above).

3.1.1.19. *The ancient influence of Indo-European horsebreeding on eastern Asia (China)*

Since the Przewalski horse, which ranged throughout a vast territory of eastern Asia, is ruled out as the ancestor of the domestic horse, the horse as a transport animal must have been imported from the western regions of Asia, precisely the area where it was first domesticated by tribes evidently of Indo-European origin. Together with the horse, Central and East Asia received a whole complex of ritual and mythological concepts about the horse and associated rites, which must have arisen in connection with its domestication. This is the only explanation possible for the striking similarity between the Indo-European complex of beliefs associated with the horse and those of Altaic-speaking peoples.

Altaic traditions include a horse sacrifice, analogous to that of Indo-European, connected with the worship of the Sky God and his sons (Koppers 1929, 1935), and the horse is associated with the Cosmic Tree as in Indo-European (Toporov 1973:159, 190).²²

This entire complex of ritual and mythological concepts associated with horses must have been imported together with the horse farther to the east, into China (Vasil'ev 1976:278-79ff., Pulleyblank 1966). For the Yin culture of the second millennium B.C. the horse is the main cultic animal; it is worshipped, and it is sacrificed at the funeral of a ruler. And in Chinese cultic art of the early Bronze Age the Cosmic Tree is associated with horses (Toporov 1973:190).

The reproduction of a whole complex of Indo-European ritual and mythological concepts in East Asiatic cultures would be hard to explain except by positing long contacts with the tribes whose beliefs these were. This in turn requires that we posit migrations of Indo-European tribes which had horses, out of their original homeland (and hence out of the area of first domestication of

22. The formal and semantic resemblance of PIE **ek̑h₂wos* with the Proto-Yeniseian terms for 'mare' and 'gelding' **kut-* ~ **kus-* is interesting in this connection: Arin *quše, qus*, Asan *pen-guś, pen-kuś*, Kott~~pen~~*kuś*, Pumpokol *kut* 'mare; gelding' (Toporov 1967:318).

the horse) and far to the east, where they came into extended contact with East Asian tribes and peoples. The Tocharians, who in historical times inhabited the territory of contemporary Chinese Turkestan, can be considered a remnant of those Indo-European-speaking tribes who migrated far to the east (cf. Pulleyblank 1966).

3.1.2. *The donkey*

3.1.2.1. *The Indo-European term for 'donkey' and its Near Eastern origin*

The earliest names for the domestic donkey (*Equus asinus* L.) in ancient Indo-European languages are found in Greek (beginning with the Mycenaean period) and Latin: Gk. (Myc.) *o-no* 'donkeys', Gk. *ónos* 'donkey', pl. *ónoi*, Lat. *asinus* 'donkey', dim. *asellus*; the Old Germanic words may come from Lat. *asinus* or *asellus*: Goth. *asilus* 'donkey', OHG *esil* (Ger. *Esel*). The shared Baltic and Slavic term ultimately goes back to Germanic: OPruss. *asilis*, ORuss. *os'l'* (Russ. *osel*) 'donkey' (for other Baltic words see Toporov 1975-:I.122, with bibliographical references).

Since this earliest word for 'donkey' is restricted to Greek and Latin, there is no possibility of reconstructing it for the period of Proto-Indo-European dialect unity.²³ But the formal correspondence of the Greek and Latin cognates (Lat. *asinus* : Gk. *ónos* < **os(o)nos*, according to Brugmann) indicates that the word arose in some early dialect grouping, to be lost later in a number of branches.²⁴

The formal similarity of the Indo-European dialect protoform to Sumerian *anšu* ~ *anše* 'donkey' makes it plausible that the Indo-European term comes from some Near Eastern term, cf. Watkins 1971:1507.

In the Near East, the donkey was one of the first animals to be domesticated. The area of its first domestication is considered to have been northeastern Africa (see Vogel 1973:119). By pre-dynastic Egyptian times the donkey was already being used as a transport animal. From Africa the domestic donkey spread to the ancient Near East (Bogoljubskij 1959:464-67, Bökönyi 1974:299). Egyptian attests several terms for 'donkey': *c3* 'donkey' (also with cultic meaning, in particular as an animal sacred to the god Set), *šw* 'donkey', and *šk*

23. The Hittite word for 'donkey' is not known, since in Hittite texts 'donkey' is always rendered with the Sumerogram ANŠE. Cf. also the Sumerogram ANŠE.GÌR.NUN.NA 'mule' in Hittite texts. Mules and horses have the same status in the Hittite tradition (see Hittite Laws, §200A), which is in agreement with the fact that the term for 'mule' is based on 'horse' elsewhere in Indo-European (e.g. Skt. *aśva-tará-* 'mule').

24. A new word for 'donkey' arises in Indo-Iranian: Skt. *khára-* (absent from the Rigveda, which has the terms *párasvant-* 'wild donkey' and *rásabha-* 'domestic donkey'; the latter is harnessed to the Ashvins' carriage), OPers. **xara-*, Pers. *xar*, Oss. *xæræg* 'donkey' (Abaev 1949:I.57).

'donkey' (dim.) (Erman and Grapow 1955:I.165, IV.315, 433). That the donkey had an important economic role in the ancient Near East is evident in Assyrian trading colonies in Anatolia in the early second millennium B.C., where donkeys were the main transport animals (Veenhof 1972).

3.1.2.2. *The donkey as a cult animal among the ancient Indo-Europeans*

In ancient Indo-European tradition the donkey plays a significant role as a cult animal. In Old Hittite conceptions the donkey is a fertility symbol, its fertility compared to that of the mythic queen who bears many children: *nu-wa ANŠE-iš arkatta* 'and the donkey performs the act of fertilization' (KBo XXII 2 Vs. 9-10). The donkey is an object of similar worship in the Iranian tradition (in the Ossetic version of the Nart epic, the Narts, when cursing their sister, say, 'May the donkey of the Boratae (*Boiriaty-xæræg*) pursue her for a year!', Dumézil 1968:512-13), and also in ancient Greek and Roman rituals, particularly those associated with Dionysos, Apollo, and Vesta, cf. an ancient saying, preserved in Hesychius and pertaining to the Eleusinian mysteries: *ónos ágei mustéria* 'the donkey performs mysteries' (Cook 1894:84-86, cf. Frejdenberg 1936:99-100). This view of the donkey as a fertility symbol is reflected in later classical literature, up to the 'Golden Ass' of Apuleius. The same role may be reflected in the legend of the Phrygian king Midas, to whom Dionysos granted the power to turn things into gold. In punishment for his greed, Midas is turned into a donkey.

Traces of a cultic role of the donkey are also preserved in ancient India, where it was the god of death and also participated in ritual races, which finds an analog in the ritual competitions of Roman tradition (Dumézil 1966:278); for the cultic role of the donkey in various ancient traditions see also Vogel 1973:181ff.

3.1.2.3. *A typology of donkey cults in the Near East. Connected terms for 'horse' and 'donkey'*

The donkey worship of several ancient Indo-European traditions recalls the cultic significance of the donkey in ancient traditions of the Near East, beginning with Egypt, Sumer, and the ancient Semites.²⁵ The donkey cult of the

25. In Egypt the donkey was associated with several major deities, in particular Set: Kees 1956:72. In Sumer in the third millennium B.C. Gudea sacrificed a cart harnessed with donkeys to the god of fertility Ningirsu. In ancient Semitic tradition, reflected in the Old and New Testament, the donkey is one of the most important sacred animals, associated with the king's ritual entry into a city, flight and journeys on donkeyback, and revelations of God's will (e.g. Balaam's ass, the lost asses sought by Saul, etc.): see Ball 1910.

Near East may be connected with the great significance of the donkey as the essential transport animal, which preserved its special role in economic life even after the appearance of the horse, cf. Veenhof 1972. In those ancient cultures which made greatest use of the donkey, the horse, which appeared later, is named as a variety of donkey, which is natural given the similar external appearance of these animals (especially if we compare the donkey to the small horses of antiquity). The Sumerians called the horse 'mountain donkey' (ANŠE.KUR.RA), and in several languages one and the same stem is used for both 'donkey' and 'horse': e.g. in Abkhaz-Adyghe, Abkh. *ačy* 'horse', *ačada* 'donkey', Adyghe *šy* 'horse', *šy-dy* 'donkey', and others.

The lack of a clear Proto-Indo-European word for 'donkey', given the presence of domesticated donkeys throughout most of the territory where horses were domesticated and where the Indo-European-speaking tribes must have lived, can be explained by assuming that *eḱh²wo² was originally used with the meaning 'donkey' as well as 'wild horse; horse'.²⁶ In that case a striking parallel emerges between PIE *eḱh²wo- or its possible antecedent *seḱh²wo- (see note 21 to this chapter) and certain ancient Near Eastern terms for 'donkey', which represent an extremely early migratory word: Egypt. *šk* 'donkey' (dim.), Copt. *sēḡ* beside OTurk. *eškāk* ~ *ešgāk* ~ *ešjāk* ~ *ešāk* 'donkey';²⁷ Cl.Mong. *eljigen* 'donkey' (Vladimircov 1929:224, 353), which presuppose an ancestral form with a palatalized phoneme (Turkic *š* : Mongol. *l*) as early as Turco-Mongolian.²⁸ The presence in Turco-Mongolian of a term for 'donkey' which is similar to that of Egyptian indicates that the term together with the animal diffused from the ancient Near Eastern area into Central and Eastern Asia, where paleozoological data show that the domestic donkey is a recent introduction.

3.1.3. 'Bull', 'cow', and 'cattle'

3.1.3.1. The Proto-Indo-European term for 'bull', 'cow'

A Proto-Indo-European form is attested in all major early dialects, without gender distinction: *k'o²ou-, *k'o²u-:

26. Arm. *ēš* 'donkey', from *eḱh²wo-, may represent a survival of this ancient meaning; see note 1 above. Cognacy of Arm. *ēš* to Lat. *asinus*, Gk. *ónos* is formally less satisfactory.

27. Russ. *išak* 'donkey' was borrowed from this later Turkic form around the sixteenth century: see Dmitriev 1962:534.

28. The Egyptian diminutive *šk* 'little donkey' corresponds strikingly to the generic term for 'donkey' in Turco-Mongolian. A typologically analogous borrowing is that of Lat. *asellus* 'donkey (dim.)' into the Germanic languages as a generic term for 'donkey'. Borrowing of diminutives as neutral terms, or development of diminutives into neutral terms, with the former diminutive replacing the original term, is known to be a typologically widespread phenomenon.

Skt. *gāuḥ* 'bull; cow'; Avest. *gāuš* 'bull; cow; cattle'; Pers. *gāv* 'cow', Oss. *qūg/ḡog* (Abaev 1973:II.312), Arm. *kov* 'cow'.

Gk. (Myc.) *qo-u-ko-ro* = *boukóloi* 'cattle herders', Gk. (Att.) *boûs*, (Dor.) *bōs*, gen. *bo(w)ós* 'bull, cow', cf. *boû-tûron* 'butter' (literally: 'cow cheese', cf. Gk. *tûrós* 'cheese', whence Lat. *bŭtyrum*, Ger. *Butter*, Eng. *butter*).

Lat. *bōs*, gen. *bouis* 'bull, cow' (a loan from Osco-Umbrian, cf. Umbr. *bum* 'bouem' ('bull', acc.), *bue* 'boue' ('bull', abl.), Volsc. *bim* 'bull' (acc.)).

OIr. *bó* 'cow', OWelsh *buch*, OCorn. *buch*, Bret. *buc'h* 'cow'.

OHG *chuo* (Ger. *Kuh*), OE *cū* (Engl. *cow*) 'cow', OIcel. *kýr*, Latv. *gūovs* 'cow'.

OCS *govęžďi* 'cattle', ORuss. *govjado* 'bull', Cz. *hovado* 'cattle'; OCS *gumŭno* 'threshing floor' (a compound, literally: 'bull' + 'trample' = 'place where cattle crush or trample harvested grain', Vasmer 1964-1973:I.474).

Toch. A *ko*, B *keu* 'cow'.

The Hittite term for 'cow' or 'bull' is attested in texts exclusively in the form of the Sumerogram GUD (nom. GUD-uš, acc. GUD-un); the Hittite reading is not known.²⁹

In archaic compounds the root appears in zero grade: Skt. *śata-gu-* 'having hundreds of cattle', OPers. *θatagu-*, place name (originally an ethnonym 'having hundreds of cattle'), an exact correspondent to Gk. *hekatóm-bē* 'sacrifice; sacrificial animal; sacrificial rite' (orig. 'sacrifice of a hundred bulls'), Thieme 1952:62ff.³⁰

3.1.3.2. The dialect differentiation of 'bull' and 'cow'

The evidence of the ancient Indo-European dialects shows that the original word meant 'bull' or 'cow' without differentiation (cf. the Sanskrit, Old Iranian, Greek, Italic, and Slavic cognates). Semantic differentiation and specialization arose only later, in individual dialects. In Tocharian, Armenian, Celtic, Baltic, and Germanic the ancient root comes to mean only 'cow', while the meaning 'bull' is expressed by other roots:

PIE **ukʰos-en-* (originally 'moisten, water': Skt. *ukṣāti* 'makes wet, sprinkles', Avest. *uxšyeiti* 'sprinkles'): Toch. B *okso* 'ox', Welsh *ych* 'bull',

29. On the basis of the phonetic complements of the nominative and accusative singular endings -uš and -un, Friedrich (1952:275) considers possible a reading of the Hittite word as nom. **k(u)wauš*, acc. **k(u)waun*, which agrees with PIE **kʷ(o)u-*.

30. Formally and semantically derived from the same root is **kʷoḏu-*, **kʷoū-*, originally meaning 'cow dung': Skt. *gū-ṭha-* 'excrement', Avest. *gū-ṭa-* 'mud, dirt', Arm. *ku*, gen. *kuoy* 'dung, manure', cf. OMaced. *gotán · hūn* 'pig' (acc.) (from 'dirty'), Pokorny 1959:484; Slav. **govŭno*, Cz. *hovno*, Serbo-Cr. *gónvo* 'excrement', originally 'cow dung': Vasmer 1964-1973:I.424.

Bret. *ouhen*, Corn. *ohan* 'bulls'; Goth. *aiúhsa*, Olcel. *oxi*, *uxi*, OHG *ohso* (Ger. *Ochse*), OE *oxa* (Engl. *ox*); cf. also Skt. *ukṣā́* 'bull', Avest. *uxšan-* 'bull'.

PIE **wers-en-*, **wrs-en-* (originally 'pouring forth semen', 'male', cf. Avest. *varəšna-* 'male', Skt. *vṛṣṇí-* id., *vṛṣaṇau* (du.) 'testicles'): Toch. A *kayurṣ*, B *kaurṣe* 'bull' (from **k'oou-wrs-*), Latv. *vērsis* 'bull', cf. OLith. *veřšis* 'bull', Skt. *vṛṣā́* 'bull'.

PIE **khe/or-w-* (originally 'horned', cf. Hitt. *karawar* 'horn', Avest. *srū-* 'horn', Gk. *keras* 'horned', see II.1.3.3 above): Alb. *ka* 'ox', OPruss. *curwis* 'bull', Pol. dial. *karw* 'lazy old ox' (Trubačev 1960:40).³¹

Comparison of these Indo-European forms meaning 'bull', which contrast with the original root **k'oou-* with the undifferentiated meaning 'cow, bull', allows us to reconstruct for the Indo-European dialects a process whereby the meaning 'bull' becomes lexically marked by special words. Hence a form meaning 'bull' comes to coexist with the original word, meaning 'cow, bull', as in Sanskrit.³² When there is a separate word for 'bull', the reflexes of the original word in many dialects lose the generic meaning and acquire the specific meaning 'cow', thereby becoming opposed to the specific term 'bull'.³³

It is notable that the meaning subject to special marking is 'bull' and not 'cow'.³⁴ We can thus assume that in unmarked, neutral contexts PIE **k'oou-* usually had the meaning 'cow' but could also acquire the contextual specification 'bull'.

3.1.3.3. *The economic function of the cow based on Indo-European dialect data; dairying among the Indo-Europeans. Dialect words for 'milk'*

The overlap in meaning of the **k'oou-* reflexes is preserved in the Rigveda. In Vedic, *gáu-* in neutral contexts is usually interpreted specifically as 'cow' (e.g. in the hymn to Indra, III, 31, 4; the exorcism for the return of cattle, X, 19,

31. This masculine root forms a derived feminine in **-ā* with the meaning 'cow' (in separate dialects, including Balto-Slavic): Russ. *korova*, Lith. *kárvė* 'cow'.

32. Sanskrit already has special words meaning specifically 'bull', and consequently incipient specialization of words from the root *gav-*, *gu-* in the meaning 'cow' (see Grassmann 1873:407ff.).

33. In Armenian a new term for 'bull', *c'ul*, which is opposed to inherited *kov* 'cow', is borrowed, evidently from Caucasian languages: cf. Adyghe *c'oy* 'ox, bull', Abkhaz *a-co* id., and others (see Jakovlev and Ašxamaf 1941:240, Šagirov 1977:1.107).

34. If 'cow' were the marked member of the opposition we would be dealing with the reverse of the process described above, namely with the appearance of new words for 'cow' and semantic specialization of the inherited generic term to 'bull'. Only in the later histories of individual dialects can we observe such a semantic change. The Balto-Slavic derivative of **k'horwos*, meaning 'bull', produces an opposed feminine **k'horwā* 'cow'. The loss of the masculine form in Slavic leads to the semantic specialization of the inherited generic **k'oou-* to the meaning 'bull', Slavic **gov-əd-*, which contrasts with **kórvā* 'cow'.

6ff.; and numerous other analogous contexts). In Sanskrit, *gāuḥ* is usually 'cow', presented as a dairy animal which gives 'rich milk, sweet as honey':³⁵

*urūcy àsmai ghṛtāvad bhārantī mādhu svādma duduhe
jēnyā gāuḥ* (III, 31, 11)

'Outstretched, bringing him rich milk, the noble cow
let itself be milked of sweet honey'

The symbolism of the Rigveda, which must also reflect earlier Indo-Iranian cultic tradition, frequently uses the image of a dairy cow and its milk as a symbol of cosmic fertility and the abundance of words associated with the ritual song. The song itself is often compared to a cow or to streams of milk.

The economic function of the cow as a dairy animal can be reconstructed for a period of great antiquity, either for the Proto-Indo-European stage or for very ancient dialect groupings. This function of the cow is clearly evident in the presence of words for 'milk' in the ancient dialect groupings: Gk. *gála*, gen. *gálaktos* (with subsequent phonetic changes in later dialects) 'milk',³⁶ Lat. *lac*, gen. *lactis* (from **glakt-*, with dissimilative loss of the initial velar). Cognate to this set of words is Hitt. *galaktar ~ galattar*, which denotes a pleasant-tasting, sweet plant juice used in rituals, *galank-* 'feed to satiety' (Friedrich and Kammenhuber 1975:I.61), cf. the participle *galankant-* 'sated': ...*aš-šan kuiš kururi para galankanza* 'who is sated with enmity (war)', KBo XVI 24+25 I 35/46.³⁷

The dialectal spread of the Hittite-Greek-Latin correspondence indicates that this word for 'milk' already occurred in Proto-Indo-European. This is confirmed by the presence in Old Chinese of a form **lac* meaning 'milk', which according to Karlgren (*apud* Pokorny 1959:401) must have entered Old Chinese from an eastern dialect of Indo-European. The presence of cognate words in

35. In Sanskrit and Old Iranian we already find a highly developed terminology associated with the dairying function of cows: Skt. *dhēnā* 'milk cow', *dōgdhi*, *duhāti* 'he milks', Pers. *dōxtan* 'milk' (verb), etc. (see Abaev 1958:I.371).

36. As early as Homer the term denotes an economic product gotten by milking: cf. in the *Odyssey* (4.87-89):

ἔνθα μὲν οὔτε ἄναξ ἐπιδευῆς οὔτε τι ποιμὴν
τυροῦ καὶ κρειῶν οὐδὲ γλυκεροῖο γάλακτος,
ἀλλ' αἰεὶ παρέχουσιν ἐπιετανὸν γάλα θῆσθαι

'There no man, thief or shepherd, ever goes
hungry for want of mutton, cheese, or milk —
all year at milking time there are fresh ewes.' (Fitzgerald 1963:55)

37. Both of these Hittite meanings of *galak-* can be traced to the original meaning of 'milk': milk was both a liquid given by a dairy animal and a satiating food product. In the first sense, 'milk' can be metaphorically transferred to the meaning '(white, milky) juice given by plants', cf. Lat. *lac* (*herbārum*) 'white juice of plants (herbs)', *lactens annus* 'time in spring when sap runs', Gk. *gála* 'plant juice', *galáktōsis* 'formation of plant juice'. (Cf. the numerous typological analogs for a connection of terms for sap and milk in various traditions: Ivanov 1974:127.)

Hittite and a far eastern dialect (perhaps Tocharian), and also in Greek and Latin, further confirms the Proto-Indo-European origin of this word for 'milk', subsequently replaced in individual dialects.³⁸

Another term for 'milk', 'butter', also fairly archaic in terms of dialect geography, is reflected in Aryan and Celtic and consequently goes back to the period of incipient dialect separation: Skt. *ghṛtām* 'whole milk, cream, butter' (frequent in the Rigveda, with many derivatives) and Mlr. *gert* 'milk' (Pokorny 1959:446).

Also Proto-Indo-European is the verb 'milk' **melk̑-*: Gk. *amélgō* 'I milk', Lat. *mulgeō* id., cf. Mlr. *bligim* id., Alb. *mjel* 'milk' (inf.), OHG *milchu* 'I milk' (Ger. *melken*); OE *melcan* (Engl. *milk*), Lith. *mélžti*, ORuss. *mlěsti* 'churn', Toch. A *māklune* 'milk, milking'.³⁹ The lack of a cognate in Indo-Iranian⁴⁰ is due to replacement of the original word by a derivative of **dheugh-* with the original meaning 'give milk', 'squeeze', 'manage, succeed': Skt. *duhāti*, *dógdhi* 'milks', Pehlevi *dōxtan*, *dōšīdan* 'milk', Pers. *dōxtan*, Oss. *dūcyn* (Abaev 1958:I.371-72).⁴¹

It is noteworthy that Indo-Iranian replaces both the original verb 'milk', **melk̑-*, and the original noun 'milk'. This may have had to do with specific details of the evolution of dairying among the cattle-breeding Indo-Iranian tribes after their separation from the other Indo-European tribes. The new

38. The replacement of the term for 'milk' in some of the ancient Indo-European dialects can be explained as taboo replacement, since milk played a magical role in ancient Indo-European conceptions: see Devoto 1962:275.

39. In particular in the following context: *sne māklune yo mālkant kowi* 'and the cows got milked without being milked', 63 b 5, Sieg and Sieglung 1921:1.

40. An Indo-Iranian word Skt. *mṛjáti* 'rubs, cleans', Avest. *mərəzaiti* 'brushes against', etc. (Pokorny 1959:722) is sometimes cited with **melk̑-* (although with reservations), but is more likely cognate to Gk. *amérgō* 'tear off, break off', Lat. *mergae* 'pitchfork' (the root is **merk̑-*; for the Iranian words see Abaev 1958:I, 1973:II.101).

41. These original meanings can be reconstructed by taking into consideration the semantic development of the word in various dialects. The dialect words for 'daughter' are an important set that go back to this root: Skt. *duhitār-* 'daughter', Avest. *dugədar-*, Arm. *dustr*, Gk. *thugatēr*, Goth. *daūhtar*, OHG *tohter* (Ger. *Tochter*), Engl. *daughter*, OPruss. *duckti*, Russ. *doč'*, Toch. B *tkācer* (with the apparent original meaning 'breastfed', Trubačev 1959:66). Also related are formations like Skt. *Kāma-duh(ā)*, the name of a mythic cow which grants any wish (originally 'giving milk in abundance'); the second element *-duhā* corresponds to the name of the Greek goddess *Túkhē* (probably originally 'cow granting wishes'), beside *tugkhánō* 'hit mark, achieve' (see Pokorny 1959:271). Also connected with the image of abundance of milk is the cognate OIr. *dúan* 'song, poem'.

Another symbol of abundance which is connected with milk in Indo-European tradition is **ēudh-*, with the original meaning 'udder': Skt. *ūdhar* 'udder' (in the Rigveda the cow's udder is an image of abundance of any kind: Grassmann 1873:271-72), Gk. (Hom.) *oūthar* 'udder' (as a symbol of abundance: *Árgos ... oūthar aroúrēs*, Iliad 9.141 'to Argos ... the udder of fertile tillage'; *oúhata gār spharageúnto*, Odyssey 9.440 '(their) udders let loose (milk)'); Lat. *ūber* 'udder, teat, breast' and also 'fertility, abundance of fields, fertile field'; OHG (dat.) *ūtrin*, MHG *ūer* (Ger. *Euter*) 'udder', OE *ūder* (Engl. *udder*), OIcel. *júgr* 'udder', cf. Lith. *ūdróti* 'be pregnant' (of a pig; from 'be pregnant (in general), originally 'swell'); ORuss. *vymja* 'udder' Russ. *udít* 'swell'.

dialect words for 'milk' link Indo-Iranian with other dialects: Skt. *kṣīrám* 'milk' (six times in the Rigveda), Oss. *æxsyr*, Munja *xšīr*, Pers. *šīr* 'milk', Alb. *hīrrë* 'whey'; Avest. *xšvīd-* 'milk', Lith. *svíestas* 'butter', Latv. *sviēsts* 'butter'; Skt. *páyas-* 'milk' (frequent in the Rigveda), Avest. *paēman-* 'mother's milk', Pers. *pīnū* 'sour milk', Lith. *píenas* 'milk', Latv. *piēns* 'milk'. Both words unite Indo-Iranian and Baltic (and in one instance Albanian).

In approximately the same dialectal area we find a dialectal word for 'sour milk', 'cheese': Avest. *tūiri-* 'curdled milk', 'whey', Gk. (Hom.) *tūrós* 'cheese', cf. *boú-tūron* 'butter'; Russ. *tvorog* 'curds'.

The same area of distribution characterizes another word, which denotes several varieties of milk: reduplicated forms in Skt. *dádhi*, gen. *dadhnás* 'yogurt, sour milk' (probably also of cultic significance, hence the priest's name *Dadhyāñc-* in the Rigveda); OPruss. *dadan* 'milk' (cf. *ructan-dadan* 'sour milk'), Alb. *djathë* 'cheese', *dhállë*, Geg dial. *dhálltë* 'skim milk', 'churning'; unreduplicated forms in Gk. *thénion* 'milk', Arm. *dal* 'colostrum', 'milky liquid'. The word is from the root **dheH(i)-*, originally 'suckle', 'nurse, give milk' (Skt. *dháyati* 'suckles' Gk. *thésato* 'he sucked', Arm. *diem* 'suck', OIr. *denaid* 'sucks', Lat. *fēlō* 'suck', Goth. *daddjan*, OHG *dīen* 'nurse, let suckle', Latv. *dēju* 'suck', OCS *dojiti* 'give the breast').⁴²

In another dialect group (Celtic, Germanic, Slavic, Tocharian) the word for 'milk' is formed from the originally verbal root **melk̑-* 'milk': OIr. *melg*

42. Related to this basic ancient meaning are both the dialect terms for 'milk' mentioned above and the semantic derivatives attested in individual dialects:

'Suckle' > 'one who/which suckles; suckling': Lat. *filius* 'son' (cf. 'daughter', note 41 above), OIr. *dínu* 'lamb', Olcel. *díkr* 'lamb', OCS **děti* 'child', Latv. *dēls* 'son', Lith. *pirm-dėlė* (*kárvė*) 'cow which bears a calf for the first time'.

'Give milk, nurse' > 'one who nurses; wet nurse': Skt. *dhātṛi* 'nurse', *dhenú-* 'giving milk', cf. Avest. *daēnu-* 'female quadruped', Pehl. *dāyag* 'nurse', Gk. *thēlus* 'feminine; female (animal)', *tithēnē* 'nurse', Lat. *fēmina* 'woman' (literally 'one who feeds'), *fēlix* 'fertile; happy' (from *'giving milk'), OCS *děva* 'maiden' < 'woman', Alb. *dële* 'sheep'.

Also related to these are the meanings 'milk cow' and 'milk (a cow)': Skt. *dhēnā* 'milk cow', Mlr. *delech* 'milk cow'; Gk. *thēsthai* 'milk (a cow)', cf. Russ. *doit* id., *doenoe moloko* 'dairy milk' (see Toporov 1975-:I.285); and also 'nipple; mother's breast' (Gk. *thēlē* 'mother's breast', Mlr. *del* 'nipple', OHG *tila* 'woman's breast', OE *delu* 'nipple').

The system of meanings of these various dialect words has particular interest for the typology of change in this semantic field. The original meanings 'suck(le)', 'nurse, feed with milk', and 'give milk' were undifferentiated, and all the remaining meanings, including 'milk (a cow)' and 'dairy (cow)', can be related to them. A typological comparison is Egypt. *mhr*, which had all these meanings: 'milk (a cow)', 'suckle', 'give milk (of a cow)', 'nurse (a baby)', whence the terms for 'infant', 'unweaned young animal' and for dairy implements (Erman and Grapow 1955:II.115-16). Therefore it is difficult to pick out an original meaning for the semanteme 'milk (a cow)' as specifically either from 'suck' or from 'give milk'. If it goes back to 'suck', this may indicate that the original means of milking animals was sucking (cf. Trubačev 1960:9-10, Toporov 1975-:I.285). It would not, however, mean that the speakers of Indo-European dialects with the root **melk̑-* 'milk (a dairy animal)' were unacquainted with ordinary milking. It is more likely that the connection of the meanings 'suck' and 'milk (a dairy animal)' reflects earlier ways of using domestic animals and associated symbolic concepts. A definitive solution to this problem requires a semantic typology based on a broad ethnographic survey.

'milk', *bó-milge* (gen.) 'cow's milk', *mlicht, blicht* 'milk'; Goth. *miluks* 'milk', OHG *miluh* (Ger. *Milch*), OE *meolc* (Engl. *milk*), OIcel. *mjǫlk* 'milk' (the Slavic terms are usually considered loans from Germanic: OCS *mlěko*, Russ. *moloko* 'milk'); Serbo-Cr. *mlâz* 'the quantity of milk from one milking', ORuss. *ml"zu, mlěsti* 'churn butter';⁴³ Toch. A *malke*, B *malkwer* 'milk'.

The abundance of such dialect words for milk, milk products, and milking, and the names for domestic animals, especially young ones, formed from them testify to an elaborate livestock-breeding terminology and a developed dairying economy by Proto-Indo-European times. Another consequence of this culture is the Proto-Indo-European metaphor by which the udder and the milk cow were poetic symbols for any kind of abundance. Even by Proto-Indo-European times images symbolizing abundance with milk had become features of poetic and religious speech, as is reflected in Indo-European literary, mythological, and ritual traditions.

3.1.3.4. The cow as a cultic and ritual animal among the ancient Indo-Europeans

Another important function of the cow is reflected in Sanskrit tradition in the ritual of sacrificing a pregnant, 'eight-legged' (*aṣṭāpādī*)⁴⁴ cow, whose fetus was removed and sacrificed to the gods. The ritual was Proto-Indo-European, as is proven by the existence of an identical rite in Rome: a pregnant cow (*forda boue*) was sacrificed in a ritual called *Fordicidia* 'killing of a pregnant cow' (Dumézil 1966:364-66).

This Aryan-Italic ritual and mythological correspondence give particular significance to an Old Hittite symbolic passage (Testament of Hattusilis, Sommer and Falkenstein 1938) which points to an analogous rite in the Hittite tradition: *apaš annaš-šiš-ma GUD-uš man huišwanti-wa-ma-kan GUD-iš ŪR šarrir* 'and she, his mother, (cried out) like a cow: They have torn out the womb of a living cow!'⁴⁵

43. With a secondary development of the meaning 'suck' in Slovak (Moravian) *mlze* 'suckles' (of children and calves): Vasmer 1964-1973:II.645; see above for semantic shifts within this semantic field.

44. This term reflects the distinctive Indo-European feature of classifying living beings by the number of legs: see I.1.2.4 above for bipeds vs. quadrupeds. The Greek term for a sea monster or octopus is interesting here: Myc. *po-ru-po-de-*, Gk. *polúpous*, gen. *polúpodos*, literally 'many-legged'; as are Skt. *a-pád-* 'legless' (in the Rigveda, of the snake *Vṛtra*, which the god Indra kills) and *éka-pad-* 'one-legged' (in the Rigveda, used of the goat at the Cosmic Tree), and also Gk. *trípous* 'three-legged' in the full text of the Sphinx's riddle (cf. Porzitz 1968:172).

45. A typological parallel to the sacrifice of a pregnant cow and removal of the fetus from the womb can be seen in several stock-raising African societies, where — as in Indo-European traditions — a fetus torn out of the womb is offered to the gods (Dumézil 1966:365).

3.1.3.5. *The economic significance of cows and bulls in ancient Indo-European traditions*

The whole set of functions of the milk cow, which produced young animals and fed them, gave the cow special economic significance in comparison to other domestic animals, in particular bulls.⁴⁶ In the Old Hittite Laws (§67) a cow has a substantially higher value than a working bull: in the Old Kingdom, the reparation for one stolen cow was 12 working bulls. On the other hand, a pedigreed breeding bull, indispensable for propagation, was valued more highly than a cow. The theft of one breeding bull in the Old Hittite kingdom required a payment of 30 working bulls and calves (Hittite Laws, §57).

Hittite tradition, like other ancient Indo-European traditions, reflects the functions of bulls as plowing animals (the Hittite Sumerogram is GUD.APIN.LAL 'plowing bull'). According to the Hittite Laws (§178), a plowing bull was the most highly valued of all (12 shekels of silver), a breeding bull (GUD.MAH) was next (10 shekels), followed by a pregnant cow (GUDÁB *armahhant*-, 8 shekels), then an adult cow (GUDÁB.GAL, 7 shekels), while a harness horse (ANŠE.KUR.RA *turiyaš*) was worth 20 shekels (§180). This hierarchy of prices reflects the special value of a plowing bull compared to an ordinary bull or even a breeding bull or pregnant cow. But a draft horse was valued much more highly than any cow or bull, a fact which is in agreement with the nature of ancient Indo-European rituals examined above.

By this time, i.e. by the first half of the second millennium B.C., the horse had already become the main transport animal, displacing the bull in this function. For the earlier period prior to the domestication of the horse, before it assumed the role of basic transport and draft animal, and before the development of the harness itself (for which see below, on terminology for transportation and harness), the bull was the main draft animal and means of transportation. Traces of this earlier function of the bull are still visible in historical Indo-European traditions.

3.1.3.6. *The domestication of the bull and the relation of Indo-European terms for 'bull' and 'cow' to Near Eastern and Central Asian migratory terms*

The domestication of the wild bull (*Bos taurus* L.) and the presence of cows and bulls among domestic animals go back to an ancient period well before the domestication of the wild horse. Evidence of domesticated bulls and cows is found by the beginning of the Neolithic. There are two major centers of cattle domestication in Eurasia: a European zone where the ancestral wild cow was the

46. In these traditions the higher value of a cow compared to a bull increased after the introduction of the horse as a means of transport.

huge European bison (*Bos primigenius* Boj.), and a western Asian area where the ancestral wild cows were distinct species, one short-horned (*Bos brachyceros*) and one long-horned (*Bos longifrons*). The western Asian area is considered the center of first domestication of wild cattle (Curwen and Hatt 1953:43-44, Clark 1952:122-23, Semenov 1974:292-93, Perkins 1973). Çatal Hüyük in Asia Minor — a culture dated to the seventh to sixth millennia B.C. — yields drawings representing bulls with riders, indicating that bulls were ridden as part of the taming process (see Illustration 8).



Illustration 8.

Drawing of a man riding a bull. Çatal Hüyük, 7th-6th millennia B.C.

The domestication of several varieties of wild cattle was a continuing process that went on over a long period of time in the two centers of domestication. The result was gradual changes in the physical appearance of domesticated cattle and the formation of special breeds of domestic cattle (Clark 1952:122-23).

The two areas — the Near East (including Greece and the adjacent Balkan region) and southeastern Europe — show considerable discrepancy in their respective dates of first appearance of domesticated cattle: in the Near East domesticated cattle are found in Çatal Hüyük, northern Mesopotamia, and northwestern Iran around 7000 B.C.; Thessaly and the adjacent Balkan area are considered by some scholars to be the area of oldest cattle finds (Bökönyi 1974:109) while in southeastern Europe cattle remains are found only from the end of the fifth and the beginning of the fourth millennia B.C. onwards (see Berger and Protsch 1973:220, 224).

Various ethnic elements could have participated in this long process of

domestication, as is supported by the distribution of resemblant terms for 'cow', 'bull' not limited to related linguistic groups. These terms — which refer to both wild and domesticated cattle — are migratory words.

Indo-European dialects preserve words from a common base **thauro-* — originally 'wild cow, wild bull' in Indo-European — a Near Eastern migratory term, which shows that the speakers of these dialects were acquainted with the wild cows found specifically in the Near East (*Bos brachyceros* and *Bos longifrons*). The domestication of these species of wild bovines must have given rise to domestic cattle, referred to by the common word **k'oou-*.⁴⁷ This conclusion is in agreement with another, strictly linguistically based argument that the term for the European bison (*Bos primigenius* Boj.) is a later innovation of individual dialects derived by phonetic alteration of the original stem **thauro-* (see II.2.1.9.3 above).

That speakers of Proto-Indo-European were among those who domesticated wild cattle is also shown by the presence in Indo-European dialects of another term for 'bull', derived from the verb **t'emH-* 'tame, subdue; bridle; force': OIr. *dam* 'bull', Ved. *damya-* 'young bull to be tamed', Alb. *dem* 'young bull' (Mayrhofer 1963:II.35), Gk. *damálēs* 'young bull to be tamed', *damálē* 'heifer' (for this root see II.1.3.3n23 above).

Such facts increase the plausibility of the relatedness of PIE **k'oou-*, **k'ou-* and Sumerian GUD 'bull; cattle' proposed long since by Ipsen (1923:175ff.). The word reflected in Sumerian *gu(d)* 'bull; cattle', phonetically *gu* = [ɣu] according to Diakonoff 1967:49, is evidently a Near Eastern migratory term of wide distribution. It is found in Egyptian (beginning with the Old Kingdom) in the form *ng3w* 'type of large bull with long horns, especially as a sacrificial and harness animal', 'god in the form of a bull' (Erman and Grapow 1955:II.349); cf. also the later attested *gw* 'type of bull' (ibid. V.159). It is highly plausible that the Sumerian and Egyptian forms are connected — perhaps via other languages — with the postulated Indo-European forms **k'oou-* and **k'ou-*. The sequence of a velar nasal /ŋ/ and a pharyngeal in Egyptian is comparable to the glottalized labiovelar of Indo-European.⁴⁸

Further to the east a similar term for 'bull; cattle' is found in ancient East Asia, specifically in Old Chinese in the forms *'kuo* and *,ngiɰu* (Nehring 1935:73-77) and in a number of Altaic languages (Ramstedt 1946-1947:25) which show a distinctive semantic shift from 'cow' to 'female quadruped' to 'mare': Manchurian *geo* 'mare; cow; female (of quadrupeds)', cf. *geo murin*

47. Together with these new terms, some dialects preserve the original word for 'wild bull', with phonetic transformations, as a term for the domesticated bull or steer: Avest. *staora-* 'bull, cow', Oss. *stur/stor* 'bull; cow', Pehl. *stōr*, Pers. *sutūr*, Goth. *stiur* 'steer', OIcel. *stjórr*, OE *stēor* (Engl. *steer*), OHG *stior*, and others.

48. A similar root *gu-* 'stockyard' can also be posited for Northwest Caucasian: Abkh. *a-gup* 'collective of herders', *a-gʷarta* 'herd', Bžanija 1973:85.

‘mare’ (literally ‘female horse’), Jurjen *k’ó mù-lîn* ‘mare’, Evenki *gēγ* ‘mare’, *goγo* ‘female wild deer’, Cl.Mong. *gegün* ‘mare’ (Cincius 1975:145).

The agreement among various forms of linguistic evidence for terms for ‘wild bull’ and ‘domesticated bull’ pinpoints the Near East as the area of first acquaintance with the wild and the domestic bull.

3.1.3.7. *The cultic role of the bull among the ancient Indo-Europeans*

The congruity of Indo-European terms for wild and domestic bulls with Near Eastern migratory words, and the Near Eastern locus for the first domestication of cattle, are both in essential agreement with the similarities between archaic Indo-European conceptions of cosmic deities as bulls and corresponding notions in Egyptian, Sumerian, and ancient Semitic mythology.

In the Rigveda, gods of thunder such as Indra and Parjanya (and sometimes also the Ashvins) are constantly called bulls. An example from the Hymn to the dream of the Moon:

sahāsraśṛṅgo vṛṣabhó yáḥ samudrād udācarat (VII, 55, 7)
 ‘thousand-horned bull, who rose up out of the sea’

Analogous symbolism equating a lunar deity with a bull is also known in ancient Mesopotamia (Labat 1970:280) and was discovered recently in an ancient culture of southern Turkmenia of the third to second millennia B.C. (Masson 1976:435-36).

In addition, in the Rigveda a sacred bull is indirectly associated with the sun: in a wedding hymn, two bulls (*gāvau* (du.), X, 85, 11) are harnessed to the cart of the sun goddess Surya. Later in the same hymn, ‘two bulls are slaughtered under the constellation Agha’ (*aghāsu hanyante gāvo*, X, 85, 13), which can be seen as a trace of cosmic sacrifice associated with the Sun. An analogous sacrifice of bulls associated with a deity is attested in Anatolian traditions, in the Hittite-Palaic ritual KBo XIX 153 III 14: EGIR.ŠU-*ma* GUD.MAḤ *ši-pa-an-ti nu* SALŠU.GI *ma-al-ti* ‘and then he sacrifices a breeding bull and the Old Woman prays’ (and cf. in older Russian traditions *molit’ byka*, literally ‘implore (a) bull’, meaning ‘sacrifice’).

In ancient Greek tradition we find the *bouphonia*, or festival of ritual slaughter of a sacred bull. The festival is a complex of ritual activities preparing for the slaughter of the bull (which has eaten sacrificial bread), and is divided among performers of various functions: ‘water-bearing maidens’ bring water to wash the axe and knife, the ‘first stabber’ stuns the bull with the axe, and the ‘second stabber’ kills it with the knife and escapes (Frejdenberg 1936:95). This tradition has its roots in deep antiquity and echoes the Cretan

tauromakhía (Pendlebury 1939:219, fig. 39 et pass., Webster 1958) and the even earlier traces of bull cults in Çatal Hüyük in ancient Asia Minor (seventh to sixth millennia B.C., Mellaart 1967). If the Mediterranean tradition of sacral bull games ending with the sacrifice of the bull goes back to ancient Asia Minor, it also continues, transformed in character, in the form of the modern bullfight, the *corrida*.

In Greek tradition we also find bull sacrifice replaced by a sacrificial loaf depicting a bull (Frejdenberg 1936:197, 402). A similar custom is reflected in Sanskrit tradition and especially in the Slavic practice, preserved until recently, of baking a kind of loaf called *korovaj* which figured in weddings as a masculine symbol and whose name is based on the ancient term for 'bull', **korv-* (cf. Pol. dial. *karw* 'old ox'; for *korovaj/karavaj* see Ivanov and Toporov 1974:244-58).

According to Procopius (fourth century A.D.), the Slavs sacrificed bulls to their god 'Thundermaker'. This custom corresponds to the Sanskrit and ancient Greek conceptions of the thundergod (Indra, Zeus) as a bull; it was preserved among the East Slavs in the rite of slaughtering 'Elijah's bull' on the day (in the Orthodox calendar) of the prophet Elijah. (The name of the prophet Elijah, also known as 'thunder-hurler' among the East Slavs, replaced the old pagan name for the thunder god: Ivanov and Toporov 1974:169.) Rites of bull sacrifice are also attested in ancient Germanic archeological sites (Beck 1965:58, 62, 65, 182).

Parallel metaphors in Sanskrit, Greek, and Old Irish traditions permit reconstruction of an image whereby a hero was equated to a bull and women or girls to cows (Campanile 1974); cf. also the equation of a woman to a heifer (GUD) in the Hittite tradition (in the prayer of queen Puduhepa to the goddess Arinna, KUB XXI 27).

Taken together, all these facts clearly show the great antiquity of the function of bulls in worship, transport, and the economy of Proto-Indo-European society. Only in the later Proto-Indo-European tradition, after the introduction of the horse, did the bull yield its cultural primacy.

3.1.4. *Sheep, ram, and lamb*

3.1.4.1. *The Proto-Indo-European words for 'sheep', 'ram', and 'livestock'*

A Proto-Indo-European stem meaning 'sheep' is reconstructed as **Howi-*: Luw. *ḫawi-* 'sheep', (Hier.) *hawa/i-* (Laroche 1959a:44-45, 151), Skt. *ávi-* 'sheep', *aviká* 'sheep', *avi-pā(lá)-* 'shepherd', Arm. *hoviw* 'herder' (from 'shepherd', cf. Skt. *avi-pālā-*), Gk. *ó(w)is* 'sheep, ram', Lat. *ouis* 'ram, sheep', OIr. *óí* 'sheep'; OIcel. *ǽr*, OE *ēow* (Engl. *ewe*), OHG *ou* 'sheep', Goth. *awistr* 'sheep stall'; Lith. *avis*, Latv. *avs* 'sheep', OCS *ovīca* (< **owi-kā*) 'sheep'. The dialect

geography of the word (Anatolian, Greek-Armenian-Aryan, and also Ancient European) places it at the stage of Proto-Indo-European linguistic unity.

The Iranian dialects lack reflexes of ***Howi-**, and use instead forms derived from PIE ***p^heḱh-(u-)**, meaning ‘sheep, small livestock’: Avest. *pasu-* ‘live-stock, small livestock’, Sogd. *psw* ‘small livestock’, Oss. *fys/fus* ‘sheep, ram’. Traces of a meaning ‘sheep’ for this root can also be observed in Latin and Germanic: Lat. *pecus*, gen. *pecoris* (neut.) ‘livestock; domestic animals; small livestock (principally sheep)’ (cf. *pecus capraeque* ‘sheep and goats’, poet. *pecus lānigerum* ‘wool-bearing sheep’); *pecus*, gen. *pecūdis* (fem.) ‘domestic animal; small livestock (primarily sheep)’ (cf. *armenta et pecudes* ‘large and small livestock’, *pecus Hellēs* ‘Helle’s animals’, in myth a golden-fleeced ram on which Helle flew across the Hellespont); OIcel. *fær* ‘sheep’.



Illustration 9.
Ritual vessel with ram's head. Ancient Balkan culture,
5th millenium B.C.

3.1.4.2. The Indo-European word for ‘wool’ and wool-working terminology

Together with ***Howi-**, several Indo-European dialects use derivatives of ***p^heḱh-** to mean ‘sheep’. The antiquity of the latter term in the meaning ‘sheep’ can be seen in the use of derivatives from this root to designate ‘comb’, ‘wool’, ‘fleece’, ‘hair’: Gk. *pékō*, *péktō*, *pektēō* ‘comb, shear’; *pékos* ‘fleece, wool’, (Hom.) *pókos* ‘wool, sheared sheep’s wool’, Lat. *pectō* ‘comb (wool or hair)’, *pecten* ‘comb’ (for wool or hair), OHG *fahs*, OE *feax* ‘hair’, *feht* ‘fleece’, Lith. *pašyti* ‘pluck’ (typically with *vilna* ‘wool’), cf. Arm. *asr* ‘sheep’s wool; fleece’; probably also cognate are Skt. *pákṣma* ‘eyelashes; hair; wool’, Avest.

pašna- 'eyelid', Pehl. *pašm* 'wool', Oss. *fæsm* 'wool shorn in autumn' (see Pokorny 1959:797).⁴⁹

We can therefore reconstruct two forms meaning 'sheep' for Proto-Indo-European: ***Howi-** and derivatives of ***phek̑h-**. The latter also provides a ***u-**stem, ***phek̑h-u-**, restricted to the meaning 'livestock' (i.e. domesticated horned animals, large and small, as a collective: see II.1.2.2n5 above).⁵⁰

From the meaning 'livestock' follows the meaning 'possessions, property', hence 'money': Skt. *pásu-*, gen. *paśváḥ* 'livestock', *puru-kṣú-* 'wealthy' (literally 'having much livestock'), Lat. *pecū*, gen. *pecūs* 'livestock' (large and small), *pecūnia* 'movable property, wealth, property', cf. *pecūlium* 'property, movable property'; Goth. *faíhu* 'money, property' (see Benveniste 1969:I.53-57), Oícel. *fé* 'livestock, possessions, money', OE *feoh* 'livestock, movable property, money', OHG *fihu* 'livestock' (Ger. *Vieh* 'cattle'); OPruss. *pecku* 'livestock', Lith. *pėkus* 'livestock'.

Thus, for Proto-Indo-European, we must distinguish, formally and semantically, two different derivatives of ***phek̑h-**: one is the ***u-**stem meaning 'livestock, cattle' and hence 'movable property', and the other is the series of derivatives meaning specifically 'sheep', 'fleece', 'wool', 'hair' (with the parallel term ***Howi-** for 'sheep'). A number of daughter languages preserve both terms for 'sheep' (e.g. Lat. *ouis* and *pecus*, gen. *pecoris* beside a stem in *-ud-* in *pecus*, gen. *pecūdis*; Oícel. *jár* and *fjár*), or derivatives from both words for 'sheep' (e.g. Arm. *hovi* 'shepherd' and *asr* 'sheep's wool, fleece',⁵¹ Gk. *ówis* and *pókos*; etc.).

A complete transformation of the Proto-Indo-European terminology for 'livestock, cattle' and 'sheep' takes place in Iranian. The descendants of PIE ***k'oou-** 'cow, bull', ***thauro-** 'wild bull' become generic terms for cattle

49. Together with this root, and parallel to it in the meanings 'comb' (noun and verb), are attested derivatives of ***kbes-**: Hitt. *kišai-* 'comb' (wool, especially sheep's wool), *šlGkišri-* 'woollen articles', Russ. *česat'* 'comb, card', Mlr. *cfr* 'comb', Gk. *ksánion* 'card for combing wool', etc.

The basic term for 'wool' (i.e. sheep's wool) in Indo-European was ***Hw̑l-n-**: Hitt. *hulana-*, Skt. *úrñā*, Avest. *varəṇā-*, Gk. *lénos*, Lat. *lāna*, Goth. *wulla* 'wool', OHG *wolla* (Ger. *Wolle*), Lith. *vilna*, Latv. *viľna*, ORuss. *v'ľna*, Russ. dial. *vól'na* 'sheep's wool'. Hittite still preserves a connection of the term for wool *hula-na-* with a term for working wool, *hulaliya-* 'wind, reel' (of wool), and the term for 'spindle', *hula-li-*.

50. In this generic sense 'cattle', PIE ***phek̑hu-** is transferred to Central Asian, particularly Altaic, languages: OTurk. *öküz* 'bull, ox', Uzbek *həkyz*, Chuvash *văkăr*, Mong. *üxer* 'cattle, cow', *üxer žil* 'year of the bull' (the second year of the animal cycle), Tungusic *hukur* 'bull, cattle' (Ramstedt 1946-1947:25, cf. Ščerbak 1961:98). The regular phonetic correspondences displayed by the Altaic forms show the great antiquity of this borrowing from Indo-European, which evidently took place in the period of Altaic dialect unity.

51. Arm. *asr*, gen. *asu*, adjective *asu-et* 'woolly' must be seen as a derivative of ***phek̑h-** with the heteroclitic suffix *-r/-u*, which is distinct from the non-heteroclitic *-u-* of PIE ***phek̑hu-**. For the Armenian formation cf. Arm. *metr*, gen. *metu* 'honey', adjectives like *barjr*, gen. *barju* 'high', etc. (see Benveniste 1935:36).

(Avest. *gav-* 'cattle', *gāuš urvan-* 'soul of cattle', *gao-dāyah-* 'taking care of cattle'), displacing the original term for 'cattle' ***phekhu-**, which takes the place of ***Howi-** 'sheep', lost in Common Iranian. Thus ***phekhu-** acquires the restricted meaning 'small livestock; sheep, ram' in Iranian and falls in with the derivatives of ***phekhu-** to produce a formally undifferentiated group of words: Avest. *pasu-* 'cattle; small livestock', Sogd. *psw* 'sheep', Khotanese Saka *psa-* 'sheep; small livestock', Pehl. *pah*, Kurd. *pes, pas*, Talysh *pas*, Pashto *psə* 'sheep; small livestock', Oss. *fys* 'sheep' (see Abaev 1958:1.500-501).

The existence of two words for 'sheep', ***Howi-** and ***phekhu-**, in Proto-Indo-European must point to a distinction, functional or economic, of varieties of sheep. The etymological connection of ***phekhu-** with words denoting shearing and combing wool may indicate that the root referred to a type of sheep which was shorn for its wool. The other word, ***Howi-**, may have been a generic term for sheep, or it may have referred to another variety. (An etymology of this word is given below.)

There can be no doubt that ***phekhu-** 'cattle; livestock; movable property; wealth' and ***phekhu-** 'comb (wool)', then 'sheep', are etymologically identical. Thus the original generic term for livestock may well have been based on the word for 'sheep' in Proto-Indo-European. This fact suggests that sheep significantly dominated in the Indo-European herds and were the most important and most common domestic animal at an early stage of Indo-European culture history.

3.1.4.3. *Sheep and sheepherding among the ancient Indo-Europeans and their historical connection with Near Eastern sheepherding economies*

The reconstruction for early Indo-European of a herding economy with sheep as the dominant animal presupposes a Proto-Indo-European homeland in an area where domesticated sheep were already widespread by Proto-Indo-European times. The paleozoological conclusions on the domestication of sheep are that it took place first in mountainous areas and in the range of the mouflon (*Ovis aries musimon*), which extended from Cyprus and Asia Minor to Iran. In their chromosome inventory all modern breeds of sheep are considered to descend from a single type which was domesticated in the Near East: see Matolcsi 1973, Perkins 1973, Ucko and Dimbleby 1969:149. Farther to the east, from Central Asia and Afghanistan to Tibet, and somewhat later, the urial (*Ovis ammon vignei*) was domesticated; still further east is the area where the argali (*Ovis ammon* L.) was domesticated, in Central and Eastern Asia from the Pamirs to the Kamchatka Peninsula (Semenov 1974:290-91). In Europe, up until the late Bronze Age (i.e. until the first millennium B.C.) sheep composed a relatively small portion of the livestock (for quantitative data on the European

area see Clark 1952:117-18). The early European breeds of sheep descend from the mouflon (in its European variety: *Ovis aries palustris*) and belong to the Near Eastern–Caucasian group of sheep (Perkins 1973, Ucko and Dimbleby 1969).

The appearance of domesticated sheep in the south of eastern Europe coincides in time with the appearance of cattle in that area (Curwen and Hatt 1953:41). The earliest finds of sheep (in peat bogs) in Britain are Neolithic (2500-2000 B.C.), which is consistent with the complete absence of traces of wool in Neolithic Europe (Clark 1952:234-35).

A developed sheepherding economy where sheep comprised the bulk of the livestock can safely be posited for prehistoric times only in or near the areas where sheep were first domesticated, which speaks in favor of locating the original Indo-European territory near where the mouflon was first domesticated. As is well known, later on in a subpart of this area — in Asia Minor — fine-wooled sheep were introduced from Miletus and Sardis. The legend of the Golden Fleece and the Argonauts in Colchis, where sheep-breeding was developed in great antiquity, can be related to the appearance of this new type of wool.

3.1.4.4. *The cultic significance of sheep, wool, and spinning in ancient Indo-European traditions*

The importance of sheep in the ancient Indo-European economy is reflected in the religious significance of sheep and wool in Indo-European culture. Sheep, together with horses and cows, are the three main sacrificial animals. There was a blood sacrifice of sheep, by slaughter (in the Old Indic, Old Iranian, Roman, Germanic, and Slavic traditions), and a bloodless sacrifice of shorn or plucked wool.

Hittite texts reflect a special rite connected with the shearing of sheep and dedication of the wool to a female divinity Kamrusepas (Goetze 1938:88ff.). In the Hittite-Luwian ritual KUB IX 4 II 10-43 and others similar to it, a sheep is the main cultic animal, with which the Old Woman performs various magic acts. The sheep (Luw. *ḫawiš*) was thought to help drive out the 'misfortunes' which are enumerated in detail in the ritual (cf. below on the Biblical 'scapegoat').

In the myth of the fertility god Telepinus who disappears and reappears, the Cosmic Tree (*GIšeya-*) is erected before him, and on it 'the fleece of a ram is hung' (UDU-*aš* KUŠ*kur-ša-aš kán-kán-za*), inside 'ram fat is placed' (UDU-*aš* IĀ-*an ki-it-ta*), and further inside a bull and a sheep are placed (GUD UDU *ki-it-ta*), KUB XVII 10 IV 27ff., see Haas 1977:117ff.

In Roman tradition a sheep (*ouis*) is dedicated to Quirinus, the main divine protector of the household (Dumézil 1966:240).

In a number of archaic traditions, a sheep cult is connected with a sacral role for wool, which had broad applications in the economy. The wool cult is usually associated with a female divinity of the Underworld, whose attribute is the spindle, symbolizing the usual economic function of that deity. In Old Hittite rituals, where wool (*ḫulana-*) and the spindle (*ḫula-li-*) are often mentioned, they are associated with the Underworld and a serpent which inhabits it (the serpent — MUŠ — sits on wool and is ‘tied up’ and ‘untied’ while on the wool: MUŠḫi.A-uš *an-da ḫu-u-la-[ni-i] ḫa-mi-ik-ta* ‘(he) tied the snake on the wool’, KBo III 8 III 8); in the ritual KUB XXIX 1 Vs. II 6-9 the ‘lower’ (*katteresš*) gods, who are seen by an eagle, hold spindles (GIŠḫulali-) in their hands; the spindles symbolize the lifespan: cf. *nu LUGAL-wa-aš MU.KAMḫi.A-uš ma-al-di-ya-an-zi ú-it-ta-an-na ku-ut-ri-eš-mi-it kap-pu-ú-wa-ú-wa-ar...* ‘and they pray for the king’s years, the brevity and sum of their years...’.

The same kind of female underworld divinities are represented by the ancient Greek Moirai and the Old Icelandic Norns, who ‘spin fate’, i.e. decide lifespans and the succession of life and death (cf. the image of the ‘loom of time’ — *Webstuhl der Zeit* — in Goethe). Notions of a goddess holding a spindle and symbolically spinning wool could only have arisen in cultures where wool-bearing sheep played an important role in the economy.

The Tajiks of Central Asia have preserved the cult of a goddess, protector of weaving and spinning, to whom barren women prayed for help. A Slavic analog to this goddess is Mokosh, a member of the basic pantheon of the ancient East Slavs, associated with shearing and spinning. Both Mokosh and the Iranian deity called *Arədvī Sūra Anāhita* in the Avesta may represent the same concept of a goddess who spins wool.

3.1.4.5. The lexicosemantic field of Indo-European derivatives from the root ‘weave’, ‘wool’

That spinning wool was seen as a source of wealth and symbol of fate is also reflected in the existence of cognate words, especially in Germanic, which refer both to spinning, yarn, and cloth and to fate, luck, and wealth: OIcel. *váð* ‘yarn’, ‘woven cloth’, OE *wæd* ‘clothes, dress’ (Engl. *weeds*), OHG *wāt* ‘clothing’ beside OIcel. *auðna* ‘fate, luck’, *auðr* ‘wealth’, OE *ēad* ‘wealth, luck’. This semantic connection can be explained by the notion of a goddess of fate who weaves or spins, distributing wealth (see Pokorny 1959:76).

If sheep, wool, spinning, and weaving are indeed linked in a single semantic field, then we are justified in seeking a common origin for their respective designations. Proto-Indo-European *Howi- ‘sheep’ may be cognate with *Hwl̥-n- ‘wool’, which is in turn ultimately related to the root *He/ou-, *Hw- ‘weave’: Skt. *ótum* ‘weave’, *ótave*, *vátave* ‘he weaves’, *ūvuh* ‘they have woven’, ppl. *ūtá-*;

cf. also *váyati* 'weaves', *vāyá-* 'weaver', *vāna-* 'weaving'.⁵² In this case, ***Howi-** 'sheep' can be analyzed as an old derivative in ***-i-** from ***Hou-** (in full grade with ***o** vocalism), while ***Hwł-n-** 'wool' is a derivative in ***-l-** from the same root in zero grade (cf. also Hitt. *hula-li-* 'spindle', *hula-li-ya-* 'wind yarn' from the same root).

It may even be that the same original root ***Hw-** with suffixed ***(e)bh-** is the ultimate source of the best-attested Indo-European word for 'weave': Skt. *vābh-* in Ved. *orṇa-vābhá-* 'descended from a spider' (epithet of a demon in the Rigveda), *ubhnāti* 'ties',⁵³ Avest. *ub-daēna-* 'made of cloth', Gk. (Hom.) *huphaínō* 'I weave', *huphé* 'weaving', OHG *weban* 'weave' (Ger. *weben*), OE *wefan*, *wębbian* 'weave' (Engl. *weave*), Olcel. *vaf* 'spindle', Toch. B *wāp-* 'weave'.

3.1.4.6. Varieties of sheep and rams and their dialect names in Indo-European

All the facts mentioned above testify to well-developed sheepherding among the ancient Indo-Europeans, with different varieties of sheep (***Howi-**, ***phekhu-**) and wide use of sheep and wool (***Hwłn-**) in the economy. The Hittites already had a diversified terminology, including names for many different kinds of sheep. In Hittite texts the Sumerogram UDU is the generic term for sheep, and subtypes are distinguished: UDU.A.LUM, UDU.ÁŠ.SAL.GÀR 'young sheep, little sheep', UDU.KUR.RA 'mountain sheep', UDU.NITÁ 'ram', UDU.SÍG+SAL 'wool-bearing sheep', UDU.ŠE 'fat sheep, fat ram', UDU.ŠIR 'breeding ram' (Friedrich 1952:298).

Special terms for 'young sheep, lamb' are preserved in individual early dialect groupings. One such ancient dialect term is ***aghono-**, reflected in Gk. *amnós* 'lamb, little sheep', *amnē* 'little sheep', Lat. *agnus* 'lamb', *agnā* 'little sheep', OIr. *úan* 'lamb', OE *ēanian* 'give birth to a lamb' (Engl. *yeen*), cf. Slav. ***agniti** (*se*) 'give birth to a lamb', OCS *agnę* 'lamb', with many early, Common Slavic, derivatives, see Trubačev 1974:I.54-57. The term is limited to the Italic-Celtic-Germanic-Slavic-Greek dialect group, one of the oldest groupings.

Another dialect term is ***wr-en-**, attested with similar meanings in Greek-Armenian-Aryan: Skt. *úrā* (fem., with the meaning 'sheep' in the Rigveda), *úraṇa-* 'ram', 'lamb'; Pehl. *warrag* 'ram', Pers. *barra* 'lamb', Oss. *wær* 'lamb'; Gk. (Hom.) (*w*)*arén*, gen. *arnós* 'sheep', 'lamb', (Myc.) *we-re-ne-ja* 'pertaining to a lamb' (Risch 1976:313), Arm. *gaʀn*, gen. *gaʀin* 'lamb'. If Lat. *ueruex*

52. In Sanskrit this root appears in two vowel grades: full ***He/ou-** in *ótum*, *ótave*, zero ***Hw-** in *vátave*, *váyati*, *vāna-*, and zero ***Hu-** in *ūvuh*, *ūtá-* (for the long *ū* cf. Skt. *īrṇā* from ***Hwł-n-**). The zero grade ***Hu-** underlies the derivative in ***-dh-**, ***Hu-dh-**, ***Hw-e/odh-**, reflected in such Germanic forms as Olcel. *auðna* 'luck' and *váð* 'cloth'.

53. For the relatedness of the roots in Skt. *ubhnāti* and *vātave*, see Pokorny 1959:1114.

'castrated ram' is cognate to these, the word can be considered significantly older, going back to a Proto-Indo-European word for a particular type of sheep or ram.

Another dialect term for 'lamb' or 'ram' is **er(i)-*: Lat. *ariēs*, gen. *arietis* 'ram', Umbr. *erietu* 'ram' (acc.), Arm. *oroj* 'lamb', OPruss. *eristian* 'lamb', Lith. *ėras* 'lamb', Latv. *jērs* beside ORuss. *jaŕ"ka* 'young sheep', *jaŕę* 'lamb', Russ. *jarina* 'sheep's wool' (in Slavic the initial part of the word may have been contaminated by the word for 'spring': Trubačev 1960:77-78). If Gk. *éripfos* 'kid', OIr. *heirp* 'goat', *erb* 'cow' are cognate to the preceding, with **-bh-* suffix and semantic transfer, then the word goes back to a much wider and consequently much older dialect grouping.

Secondary terms for 'ram' derived from **Howi-* are formed within later, smaller dialect groupings such as Balto-Slavic: OPruss. *awins* 'ram', Lith. *āvinas*, Latv. *āuns*, OCS *ovīnŭ* 'ram'.

Only within the individual branches of Indo-European do we find new terms for small livestock, sheep, and rams (often coexisting with the older terms) such as Hitt. UDU *iyanza* 'walking sheep', Gk. *tà próbata*, literally 'going ahead, walking in front', hence 'movable property', 'sheep' (Benveniste 1969:I.37-45), cf. OÍcel. *gangandi fé* 'walking livestock' (a typological parallel is OTurk. *baran* 'going, walking', the source of Russ. *baran* 'ram': Trubačev 1960:76). Semantically related to this group of words is Toch. A *śós* 'sheep', 'livestock', etymologically related to PIE **t'eukh-* 'pull; lead' (Lat. *dūcō* 'lead', OE *ūegan*, OHG *ziohan*, Ger. *ziehen* 'pull').

It is interesting that the oldest terms for 'sheep' and 'small livestock' are etymologically related to 'wool' and terms for woolworking activities (**Howi-* 'sheep', **Hwl̥-n-* 'wool', **Hw-ebh-* 'weave', **phek̑hu-* 'livestock', **phek̑h-* 'sheep', 'comb', 'wool'), while the later terms derive from verbs relating to the movement of herds (Gk. *próbaton*, Toch. A *śós*, etc.). These latter terms may reflect the migration of flocks over long distances, a practice which evidently acquired cultural significance only in the early history of individual Indo-European tribes. In a semi-nomadic economy the sheep migrated together with the human population to new habitats.

3.1.5. Goat

3.1.5.1. Indo-European areal terms for 'goat'

Indo-European terms for 'goat' for the most part have areal distributions which show that these words belonged to individual dialect groupings:

**qhoḱ̑'-*: OCS *koza* 'goat', ORuss. *koza* 'goat' (Russ. *koza*), ORuss. *koz'l'*

'male goat', *koz'le* 'kid' (Russ. *kozel*, *kozlenok*), Alb. *keth*, *kedhi* 'kid'; MDutch *hoekijn*, OE *hēcen* (Pokorny 1959:517) beside Skt. *ajā-* 'male goat', *ajā* 'female goat', *ajikā* 'goat' (for this form cf. *avikā* 'sheep'), MPers. *azak* 'goat', Pers. *azg*, Lith. *ožys* 'male goat', *ožkà* 'goat', OPruss. *wosux* 'kid', *wosee* 'goat'; also cognate is a term for goathide: Skt. *ajīnam*, ORuss. *jaz'no*. (For the correspondence *k- ~ Ø-* see I.2.4.6 above.)

The postvelar **qh-* alone is sufficient to define the form as archaic. Its dialect distribution (the main eastern groups and Balto-Slavo-Germanic) dates it to the beginning of the Indo-European breakup. The preservation of a postvelar at such a late date can be explained as sound-symbolic, a phonetic anomaly favored by the semantics of certain words. In that case the **qh-* was no longer an independent phoneme but a variant of velar **kh-* found in initial position in words of this sort (see II.2.1.7.1, II.2.1.12.1 above for animal names with initial **qh-*: **qhweph-* and **qheoph-*).

Another phonetically anomalous areal word for 'goat' is **bhuḱ'o-* (with the rare combination of a voiced aspirate and an ejective in the same root):⁵⁴ Avest. *būza-* 'male goat', Pers. *buz* 'goat'; Arm. *buc* 'lamb', Mlr. *bocc* (with geminate *-kk-*), Welsh *bwch*, Bret. *bouc'h* 'male goat', OIcel. *bukkr*, *bokkr*, *bokki*, OE *bucca* (Engl. *buck*), OHG *boc* (Ger. *Bock*) 'male goat'. A form with gemination is also found in Skt. *bukka-* 'male goat' (only attested in the lexicographers), Mayrhofer 1963:II.436. Its dialect distribution (Aryan-Armenian, Celtic-Germanic) shows that the word is an old one, to be posited for approximately the same time level as **qhok'-* (see also Porzig 1964:172).

Other terms for 'goat' are restricted to smaller dialect areas and can correspondingly be reconstructed for late stages of dialect dispersal, e.g. Lat. *haedus* 'kid', Goth. *gaits*, OE *gāt* 'goat' (Engl. *goat*) (an Italic-Germanic word, see Porzig 1964:171-72).

Several terms for 'goat' have been posited for particular dialect areas, and it is striking that Germanic participates in each of these areas (cf. also another common Italic-Germanic word for 'goat': Lat. *caper*, OIcel. *hafr*, OE *hæfer* from the original term for 'wild boar' **qhweph-*, see II.2.1.7.1 above).⁵⁵ The considerable number of different terms for 'goat' in Germanic must reflect a significant cultural role for this animal in the ancient Germanic tribes. This is consistent with the special cultic significance of the goat in ancient Germanic tradition.

54. The same irregular root structure appears in the protoform of OHG *ziga* 'goat' (Ger. *Ziege*), Norw. dial. *tikka*, Greco-Thracian *dīza · alks* 'goat', Arm. *tik* 'wineskin': PIE **t'igh-* (cf. Proto-Kartvelian **dqa-* 'goat': Georg. *txa*, Mingr.-Laz *txa*, Svan *daq-əl*; cf. also OTurk. *tekä* 'male goat', Mong. *tex* 'wild mountain goat').

55. The only areal isogloss for 'goat' in which Germanic does not participate is a Greek-Armenian-Iranian one: Gk. *alks*, gen. *aigós* 'goat', (Myc.) *aizā* 'of a goat' (adj.) (Risch 1976:313), Arm. *ayc* 'goat', Avest. *izaēna-* 'made of leather'.

3.1.5.2. The ritual and mythological role of the goat in ancient Indo-European traditions

In Old Icelandic myth, a male goat is harnessed to a god's carriage. In the Edda the thunder god Thor rides a carriage drawn by a pair of male goats (*hafrar*: *Þrymskviða* 21 et pass.). This image is a very ancient one, as is seen from the presence of similar images in a number of Indo-European traditions. In Baltic myth, the thunder god Perkunas rides a vehicle drawn by goats. Likewise in Slavic tradition, mythological characters are drawn by goats. In Sanskrit, goats (*ajā-*) are the means of transportation of gods, and they are compared in this function to horses: cf. Ved. *ajāśva-* 'male goat + horse', used of the animals harnessed to the god Pushan's carriage, see Watkins 1970a; Pushan is addressed as *ajāśvaḥ paśupā* 'owner of horses and goats, protector of cattle' (VI, 58, 2).

In the ancient Indian ritual of horse sacrifice, the Ashvamedha, a goat was killed prior to the slaughter of the horse, and it was sent to the gods as a messenger announcing the beginning of the ritual. This ritual is described as follows, in Vedic (RV I, 162, 4):

ātrā puṣṇāḥ prathamó bhāgá eti

ya jñā́m devébhyaḥ pratedáyann ajáḥ

'Thus the sacrifice to Pushan goes first —

A goat, announcing the sacrifice to the gods'

The association of goat (*ajā-*) and horse (*śva-*) in the Rigveda is further evident in the fact that a 'one-legged goat' (*ajā- ékapad-*) is depicted as standing at the center of the Cosmic Tree *aśvatthá-*.

A goat sacrifice ritual is also found in other ancient Indo-European traditions, in particular in the Germanic (Beck 1965:62-63, 65, 68) and the Roman world (Dumézil 1966:342).



Illustration 10.

Late Hittite relief depicting a goat at the Cosmic Tree

3.1.5.3. Goats and goatherding among the ancient Indo-Europeans

While it is natural for the goat to have a ritual significance in Indo-Iranian tradition, since the ancient Indo-Iranians are known to have had large herds of goats, the ritual significance of the goat in the Germanic and also the Baltic and Slavic traditions is not a direct consequence of ecological and cultural factors. In prehistoric Europe goats were introduced from Asia later than sheep. They were not frequent in the forest and forest-steppe zones of Europe (where they constituted no more than 8-10% of the small livestock). Even in the northern Black Sea region their distribution in the Iron Age (i.e. in the first millennium B.C.) is connected with the relatively recent migrations of the Iranians and Greeks (Calkin 1966:29, 88).⁵⁶ Hence the well-developed and archaic terminology for goats in Germanic, as well as the ritual significance of goats in Germanic, Baltic, and Slavic culture, must reflect an earlier Indo-European dialect stage and a corresponding state of material and spiritual culture for speakers of these dialects in which the goat played an essential role.

3.1.5.4. The appearance of the goat as a domestic animal in the Near East and its eastward movement

The earliest evidence for domestication of the goat is from Mesopotamia, where the relevant goat is of the *Capra prisca* type, a species with curling horns which subsequently appears in Europe where it survives in a few places up to the present day. This is evidenced by early seals depicting goats and by ritual figurines of goats found in the grave of queen Shub-Ad in Ur, dating from the middle of the third millennium B.C. On these seals and in these ritual figurines the goat is depicted as standing on its hind legs by a tree which evidently symbolizes the Cosmic Tree,⁵⁷ as in the well-known figurine of a goat from Ur.

The goat is primarily a mountain-dwelling animal, and in the Near East, where it is known from the earliest times, its domestication and early spread took place in mountainous regions, in a belt stretching from Asia Minor and northern Mesopotamia to historical Iran. Remains of domesticated goats from this area go back to the late ninth to early eighth millennia B.C. (Berger and

56. This picture of Europe in the first millennium B.C. contrasts sharply with stock-breeding practices for the same period in the Middle East, where in southern Iran goats comprised almost two-thirds of the small livestock (see Calkin 1966:131).

57. This ancient Near Eastern image of a male goat standing on its hind legs (human-style) at the Cosmic Tree may have been the source of the constant epithet *ékapad-* 'one-legged' for the sacred goat in the Rigveda. It is as though standing on its hind legs symbolically turned a four-legged animal (Skt. *cāuṣpād-* 'four-legged') into a one-legged animal (*ékapad-*), in contrast to two-legged (*dvipād-*) humans.

Protsch 1973:221, 223). In this mountainous area goats are the main domestic animal to the present day (see Vavilov 1959-1965:I.106, 109, 131, 136). Only later did domestic goats spread to the plains, where they adapted to the new conditions and spread rapidly. In historical times goats are important not only in mountainous regions but also in the lowlands of the Middle East and the adjacent regions of Central and Eastern Asia (see Semenov 1974:292).

3.1.5.5. *The eastward and northeastward migration of Indo-European terms for 'goat'*

During historical times the domestic goat (*Capra prisca*) spread from its original Near Eastern range to the east and northeast. This naturally led to the spread of words for 'goat', which became migratory words shared by a number of languages throughout Eurasia. Particularly interesting in this connection are terms for 'goat' in Turkic and Mongolian languages, comparable to the Indo-European words mentioned above (see Trubačev 1960:87-88) and obviously taken from them. A clear example is OTurk. *keči* 'goat' (cf. Tatar *käjä*, Bashk. *käzä*, Chuvash *kačaka* 'goat', Egorov 1964:95), which must come from an Indo-European *satem* form derived from **qʰoḱʰ-*, in a dialect where **ḱʰ* had already undergone affrication (as in Alb. *keth*, OCS *koza* 'goat').⁵⁸ Another set of words is OTurk. *ečkü* (Uzb., Kirgh. *äčki*, Kazakh *äški*), Mong. *išig* 'kid', 'young goat'. This set may come from a borrowed *satem* form from the same root **qʰoḱʰ-*, with a zero reflex of the initial postvelar and a suffix **-kʰa*, a form parallel to Skt. *ajikā* 'goat', OPers. *azak*, Lith. *ožkà* 'goat', 'kid'.⁵⁹

The spread of these words from *satem* dialects of Indo-European into Turkic and Mongolian languages may be evidence of the migration of speakers of *satem* dialects to the east and northeast in Central Asia. In this area they could have come into contact with Turkic and Mongolian speakers, with the result that these Indo-European terms for 'goat' turned into migratory words.

58. The linguistic facts alone suffice to make the claim for an opposite direction of borrowing, from Turkic into early Indo-European dialects, unacceptable: the Turkic forms with an affricate or spirant could not have resulted in the Indo-European protoform with **ḱʰ*, on which the *centum* forms with velar stop are based.

59. OTurk. *qoçqar* 'ram' may eventually go back to the same Indo-European root **qʰoḱʰ-*, with a semantic shift; a possible trace of an earlier meaning 'male goat' for this word is the name of a Central Asian (Turkmen and Kazakh) ornament: Kazakh *qoşqar mujyz* 'ram's horn', interpreted as the representation of two horned hoofed animals placed symmetrically on both sides of the Cosmic Tree and going back to ancient Near Eastern traditions (Šnejder 1927) where the animal in such representations was a goat.

3.2. Animals ritually distant from humans: four-legged and non-four-legged

3.2.1. The dog

3.2.1.1. The Proto-Indo-European term for 'dog'

A Proto-Indo-European term for 'dog' can be reconstructed as **k̑h̑won-/ *k̑h̑un-*, reflected in all the main early dialects: Hier. Luw. *sù-wa-nà-i*, Skt. *ś(u)vā*, gen. *śúnah*, Waigali *ccũ, t̑sun*, Avest. *span-*, *spānəm*, Pers. *sag*, Arm. *šun*, gen. *šan*, Gk. *kúōn*, gen. *kunós*, Lat. *canis*;⁶⁰ OIr. *cú*, gen. *con*; Goth. *hunds*, Oícel. *hundr*, OHG *hunt* (Ger. *Hund*), Engl. *hound*; Lith. *šuō*, gen. OLith. *šunės*, Latv. *suns*; Toch. A *ku*, obl. *kon*, B *ku*, obl. *kwem*.⁶¹

3.2.1.2. Blending of terms for 'wolf' and 'dog' in certain Indo-European traditions. The equation of dogs and wolves and the ritual and mythological function of the dog

In several Indo-European branches the word for 'dog' also means 'wolf': Skt. *śvaka-* 'wolf' (cf. Iranian terms for 'dog' with the same suffix: Avest. *spaka-* 'of a dog', Median *spāka*, Pers. *sag* 'dog', Parth. *spg* 'dog'),⁶² OIr. *cú* 'dog; wolf'. The transfer of the word for 'dog' to wolves can be explained by the physical similarity of early dogs to wolves (*Canis lupus* L.), which were in fact ancestral to dogs.

Wolves and dogs are also blended in various mythological traditions, where their names are interchangeable. For instance, in the Germanic tradition the two wolves which are the sacred animals of Odin/Wotan are consistently called his 'dogs'. Warriors, who in the Germanic tradition are associated with the war god Odin, are referred to both as 'wolves' (Oícel. *vargr*) and as 'hounds, dogs' — which howl like hounds (*sem hundar*), Jacoby 1974:82-83. Furthermore, a number of mythic motifs having to do with wolves and people turning into wolves are also extended to dogs: people change into dogs, taking the form of a

60. For the phonetic interpretation of the Latin form see I.2.3.2 above.

61. The Slavic word for 'dog', OCS *pľsŭ* (ORuss. *p's*", Russ. *pes*) comes from another root **p̑h̑(e)k̑h̑-o-*, in zero grade, with the original meaning 'hair, fur'. Slavic **l̑* reflects the reduced vowel which arose between two stops in zero grade. This Slavic word is originally a descriptive term for 'dog', having to do with the animal's furry coat; cf. Russ. *gustopsovyj* (composed of *gusto-* 'thick', 'dense' and *ps-*, the root in question), *psovina* 'long hair of a dog', and others. For another explanation of Slav. **pľsŭ* as going back to PIE **p̑h̑(e)ik̑h̑-* 'spotted' (Gk. *poikilos*) see Vasmer 1964-1973:III.248-49, Trubačev 1960:19ff.

62. An Iranian form with suffixed *-ka* may be the source of ORuss. *sobaka* (Russ. *sobaka*), Pol. dial. *sobaka*, Kashub., Slovincian *sobaka*, etc.: Vasmer 1964-1973:III.702-3; but see the objections in Trubačev 1960:29-33, where the Slavic forms are traced to Turkic *köpäk*, *köbäk* 'dog' (on the assumption that Turkic initial palatalized *k̑-* is reflected in Slavic as *s-*).

dog-headed monster. An example is the Germanic notion of *Hundingas*, dog people or 'descendants of dogs' who had dogs' heads (Plassmann 1961:109). Identical dog-headed monsters are known in Celtic tradition, e.g. Gaulish *Cuno-pennus* 'dog-headed' (?). A similar notion of 'dog people' (LÚMEŠ UR.ZÍR) is widespread in the Hittite ritual tradition (e.g. KUB X 65, 66, XLVI 18, 19; KBo VII 48 IX 105) and can be compared to the 'wolf people' (LÚMEŠ UR.BAR.RA, see II.2.1.1.2 above). In the Hittite ritual of the War Deity (KBo IV 9; KUB XXV II 5 IV 30) it is said of 'dog people' (LÚMEŠ UR.ZÍR) that they dress as dogs; the same ritual mentions 'wolf people'.⁶³

Ancient Indo-European traditions reflect a myth of the killing of the monster Wolf Dog, who is hostile to humans: examples are the Celtic cycle of legends about heroes (Cuchulain, Celtchar) who kill the Dog; the Maionian legend of Candaules as 'strangler of the Dog' (*kunágkhēs*), connected with a rite of puppy sacrifice that was preserved in Sardis, the capital of Lydia, until the second half of the first millennium B.C.⁶⁴ This gives particular significance to an analogous rite of puppy sacrifice in the Hittite tradition (the Middle Hittite ritual *Maštigga*, KUB XXXII 115+XXXIV 84; the Tunnawi ritual, I 61-62, III 17-18), as well as the joint sacrifice of a dog and a (captive?) warrior, KBo XV 3; KUB XVII 17 10' and others. This is echoed in the ancient Germanic rite of sacrificing people, wolves, and dogs together to the war god Odin/Wotan (see Schlerath 1954).

3.2.1.3. The influence of the Indo-European conception of dogs on eastern Asia (China)

The Indo-European rite of joint sacrifice of a human and an animal, primarily a dog, finds a striking parallel in the ritual sacrifice of warriors together with

63. There is a striking parallel to the equation of dogs and wolves in ancient Kartvelian tradition: the Svan name for the 'wolf dog' *žeyar*, to be compared with the Khevsurian *mc'evarni* 'dogs' who are identified with the 'wolf dogs' of the gods (Bardavelidze 1957:243-44 et pass.). The reference to wolves as dogs in Kartvelian may reflect an earlier euphemistic replacement of the original word for 'wolf' by other words, leading to its complete loss (see II.2.1.1.5 above). The equation of wolves and dogs is a common occurrence in the pan-Caucasian tradition reflected in the Nart epics. Also characteristic of the Caucasian, and specifically Kartvelian, mythological tradition is the depiction of the dog as man's companion and helper in hunting, see Virsaladze 1976; this finds an exact correspondence in the Hittite-Hurrian motif of the magical hunt with a dog, which, by the will of the gods, takes place in the mountains and lasts for many months (e.g. the myth of Kesshi the hunter, Friedrich 1949).

64. The dog (Lat. *canis*, Gk. *kúōn*) was also one of the symbols in a game (originally a ritual game) known as 'unlucky cast' or 'bone game'. Consequently the Skt. *śva-ghnín-* 'dog-killer' in the Rígveda refers to a successful player in the bone game. A special hymn in the Rígveda is dedicated to the bone game. Also related may be Gk. *kíndunos* 'danger' (from **kun-dunos*, literally 'dog's game', i.e. 'unlucky game', cf. Skt. *dyūtám* 'bone game'). The Russian expression *s'est' sobaku (na čem-libo)* 'learn to do (something)', 'gain experience at (something)', literally 'eat the dog (on something)' may also go back to this ancient metaphor: see Pokorný 1959:633, Vasmer 1964-1973:III.702, Pisani 1957:766ff. (but see the objections of Knobloch 1975 to this etymology of Gk. *kíndunos*).

dogs attested in numerous archeological finds from ancient China beginning with the Yin period (i.e. from the middle of the second millennium B.C.). Similar sacrifices are unknown from earlier times, which suggests that the custom was due to the influence of some western culture (Vasil'ev 1976:283-84). The generally Indo-European nature of the joint sacrifice of a warrior and a dog makes it plausible that the rite spread to China under the influence of Indo-European cultural traditions with which the population of Yin China came into contact. The plausibility of this hypothesis is increased by the fact that the Old Chinese term for 'dog', *k'iwēn*, is evidently a loan from an early Indo-European dialect (see Conrady 1925). The same Indo-European word for 'dog' became a migratory term and spread to several other languages of eastern Asia.

The dog was one of the first animals to be domesticated. Dog bones are found in caves as early as the Mesolithic. From earliest times dogs were used for a variety of cultural and ritual purposes: for food, as watchdogs, in hunting; it is this complex of functions that gives rise to the ritual function of dogs as sacrificial animals. In a striking composition from Çatal Hüyük (ca. 5800 B.C.), a man is depicted hunting a fleeing deer with a dog (Illustration 11).



Illustration 11.

Deer hunt with a dog. Çatal Hüyük, 7th–6th millennia B.C.

In the Neolithic of western Europe one variety of dog, *Canis familiaris palustris*, shows similarities to the eastern Asiatic type, specifically to Chinese dogs (Clark 1952:122), which points to cultural connections between eastern and western Eurasia.⁶⁵

65. The oldest evidence for domestication of the dog found so far comes from North America. The radiocarbon date is ca. 8400 B.C. (see Bökönyi 1974:316).

3.2.2. Pig and piglet

3.2.2.1. The Proto-Indo-European terms for 'pig' and 'piglet'

A Proto-Indo-European root **sũ* - is reflected in derivatives in all the ancient Indo-European dialects: Avest. *hũ* - 'pig' (gen.), Gk. (Myc.) *su-qo-ta* 'swineherd' (cf. Hom. *su-bōtēs*), Gk. *sūs*, gen. *suós* 'pig', cf. also *hūs*, gen. *huós* 'pig', Lat. *sūs*, gen. *suis*; Alb. *thi*; Gaul. **su-tegis* 'pigsty'; OHG, OE *sū* (Ger. *Sau*, Engl. *sow*), Oícel. *syr* 'pig', Toch. B *suwo*.⁶⁶

Derivatives in **-n-*: Lat. *suīnus* 'of a pig' (adj.), OCS *svinŭ* id., cf. Latv. *svīns* 'dirty, polluted', Toch. B *swāñana misa* 'pork'; Goth. *swēin*, Oícel. *svín*, OHG, OE *swīn* (Ger. *Schwein*, Engl. *swine*), OCS *svinija* 'pig'.

Derivatives in **-kh-*: Lat. *sucula* 'young pig', cf. Skt. *sūkara-* (Benveniste 1969:I.28), Pehl. *xūg*, Oss. *xoγ* 'pig'; OIr. *socc sáil* 'loligo [Lat.]' (literally 'sea pig'), Bret. *hoc'h* 'pig'; OE *sugu* 'pig'.

The Proto-Indo-European root **sũ* - designated an adult domestic pig, in contrast to wild pigs and wild boars, for which there was a special term **qhweph-* (see II.2.1.7.1 above). The meaning of **sũ* - is still clear in Greek, Latin, and other early dialects, where wild pigs are referred to with special terms distinct from **sũ* - (see Benveniste 1969:I.27ff.).⁶⁷

The root **sũ* - 'adult domestic pig' contrasts with another word, **phorkho-* 'piglet, young pig': Khotanese Saka *pā'sa* (< **parśa*), Kurd. *purs* 'pig', Lat. *porcus* 'piglet' (in Cato, see Benveniste 1969:I.30), Umbr. *purka*, OIr. *orc* 'piglet', OHG *far(a)h*, OE *fearh* 'pig'; OHG *farheli* 'piglet' (Ger. *Ferkel*), cf. Lat. *porculus* 'piglet', Lith. *paršėlis* 'piglet' beside *paršas* 'hog', *paršienà* 'young pork (meat of piglet)', OPruss. *prastian* 'piglet', ORuss. *porosja*, Russ. *porosenok* 'piglet', *suporosaja* 'pregnant' (of a pig), cf. Cz. (Moravian dial.) *sprasná* (*svině*) 'pregnant sow'.⁶⁸

Although this word for 'piglet' is not attested in all the main Indo-European dialects (it is missing in Tocharian, Greek, and Armenian), its dialect distribution (Iranian, Balto-Slavic, and other Ancient European groups) is sufficiently

66. The Hittite reading of the Sumerogram ŠAḪ is unknown. The phonetic complement *-aš* in the nominative (ŠAḪ-*aš*) points to a thematic stem in **-o-*.

67. In Greek, which has special words for 'wild boar', wild pigs can be referred to as *mégas sūs* (literally 'large pig', see II.2.1.7.1 above) and *sūs ágrios* 'wild pig'. In Hittite, just as there are terms for various kinds of domestic pigs, formed from the generic term ŠAḪ 'pig' (e.g. ŠAḪ.ŠE 'grain-fed pig', ŠAḪ *hīlannaš* 'barnyard pig', Hittite Laws §82; cf. UR.ZÍR *hīlannaš* 'watchdog', ibid. §89), we also find Hittite Sumerograms referring to wild pigs: ŠAḪ IZ.ZI 'forest pig' (Akkad. *išu* 'tree') and ŠAḪ GIŠ.GI 'reed pig'. In some Indo-Iranian dialects, forms derived from **sũ-* could also refer to wild pig species, a fact which can be explained by the loss of pig-raising among Iranian speakers (for the absence of any mention of pig-raising in Old Iranian texts see Benveniste 1969:I.29).

68. Hittite had a special term for 'piglet', hidden behind the Sumerogram ŠAḪ.T R 'young pig, little pig'. The accusative ŠAḪ.TUR-*an* points to a thematic stem in **-o-*.

wide that the form can be considered ancient, going back at least to the period when the early dialect groupings developed. This conclusion from dialect geography is consistent with the possibility that the word is derived from **pherk̥h-* ‘spotted’ (cf. Skt. *pṛśni-* ‘spotted’, in the Rīgveda usually of cows, cf. OIr. *erc* ‘spotted’, ‘dark-colored’, and also ‘salmon’, ‘cow’; Gk. (Hom.) *perknós* ‘black-winged’, ‘blackish’, ‘dark’), which describes the coloring of piglets (see Benveniste 1949a:77ff.).

3.2.2.2. Pigs and pig-raising in ancient Indo-European tradition

The fact that we can posit a Proto-Indo-European word meaning specifically ‘domesticated pig’, and possibly also one for ‘piglet’, points to the existence of relatively well-developed pig-raising in ancient Indo-European culture. The direct continuation of this aspect of the economy can be seen in the ancient Hittite and Mycenaean Greek cultures. Hittite and Mycenaean texts (and, later, Homer) reflect an elaborate terminology having to do with pigs and pig-raising. The Hittite Laws include special articles (§§81-86) specifying damages for theft or harm to various types of domestic pigs. The compensation differs depending on whether the stolen or harmed pig was a ‘grain-fed pig’ (ŠAḪ.ŠE, with ŠE ‘grain’), a ‘household pig’ (ŠAḪ *hīlannaš*), a ‘pregnant sow’ (ŠAḪ *armant-*), or a piglet (ŠAḪ.TUR). There is also a special Hittite and Luwian term for ‘pigsty’, *humma-*: Hitt. ŠAḪ-*aš hu-um-ma-aš* = Akkad. *ir-ri-tu ša šaḫī* ‘pigsty’ (Friedrich 1952:74; see also Laroche 1959a:47).⁶⁹ According to the Hittite Laws, a dog which has eaten lard (IÀ.ŠAḪ ‘pig fat’) is to be killed (§90). The very fact that they used pigs for food distinguished the Hittites of the Old Kingdom from the neighboring ethnic groups; a Hittite story about cannibals (2 BoTU 21) describes ritual eating of pork as a means to distinguish humans from ‘cannibals’ who do not eat pork but kill fat people for food (Güterbock 1938:105-13).

In Mycenaean Greece herds of pigs (Hom. Gk. *subósion*) were herded by people whose occupation was specifically that of swineherd (Myc. *su-qa-ta*, Hom. *subótēs*). In Homeric Greece swineherds are again distinguished (*subótēs*, and cf. also *suphorbós*); their herds are never mixed with those of other animals (see Benveniste 1969:I.41). In Homer there is also a special word for ‘pigsty’, *supheíós*.⁷⁰

69. The word appears in Hittite texts with the special cuneiform mark (Glossenkeil) indicating foreign origin: *humma-*. The word formally suggests a derivative in *-ma-* from PIE **sū-* ‘pig’, with the change of initial **s-* to *h-* as in Greek *hūs*.

70. For instance, this is the term used for the pigsty in which Circe imprisons Odysseus’s companions after turning them into pigs: *rhábdōi peplēguia katá supheoĩsin eérgnu* (Odyssey 10.238) ‘having touched them with her rod, (she) locked them in a pigsty’. A striking parallel to this image of Circe locking people in a pigsty after turning them into pigs is found in

In a number of later Indo-European cultures the early economic significance of pig-raising is lost, due to environmental and cultural-historical conditions encountered by these cultures in their new environments.

3.2.2.3. *The history of pig domestication and the spread of pig-raising in Europe*

Pigs (*Suidae*) were domesticated at a very early time in the Near East and in Greece (Thessaly). The earliest datable evidence is from Cayönü in southern Asia Minor, seventh millennium B.C. (Berger and Protsch 1973:221, 225, Harlan 1976:94). The domestic pig (*Sus scrofa dom.* L.) had important economic functions as a source of meat and fat. Pig-raising was especially well developed in forested areas, in settled and seminomadic cultures. In a number of culture areas, in particular those of hot southern areas, the use of pork and hence pig-raising in general were subject to restrictions due to the danger of poisoning and illness from pork. In such areas we find a sharp reduction in the number of pigs or a complete absence of pig-raising. Another reason for a reduced number of pigs may be a nomadic or incipiently nomadic lifestyle.⁷¹ Curtailment or complete abandonment of pig-raising may also be posited for a number of ancient Indo-European tribes, in particular several Indo-Iranian groups. In ancient India of Indo-Aryan times there are no traces of developed pig-raising, as is consistent with the loss of the word for 'domestic pig' in Sanskrit.⁷² In the territory of the Iranian tribes, in ancient Khwarezm in Central Asia, archeological and paleozoological data show extremely limited pig-raising from the seventh millennium B.C. on, and it declines and dies out completely over the next two millennia (Calkin 1966:132, 151ff.). In contrast to the Central Asian Iranian tribes, the linguistically related Scytho-Sarmatian tribes of the northern Black Sea area preserve pig-raising on a somewhat larger scale: in Scythian archeological finds, about one-fifth of the livestock consists of pigs. However, the Scytho-Sarmatian pig is close to the ancient Khwarezmian

Hittite mythology: the goddess Ishtar, who locks (Hitt. *ištap-*) Urhi-Teshub in a pigsty (*ḫumma-*) like a pig (in the autobiography of Hattusilis, XII.26).

71. Developed pig-raising is absent from Africa, including Egypt (where the main use of pigs was for threshing grain by trampling the grains from the ears, Semenov 1974:295), and among the ancient Semites, who originally settled in the extreme southern area of western Asia. After their northward movement into Mesopotamia, they borrowed the Sumerian word *šah* (Akkad. *šahū*) to refer to pigs.

72. It is interesting that, while there are no remains of pigs from the Indo-Aryan period, pigs are found at a very early time in the Mohenjo-Daro and Harappa cultures (about the third millennium B.C.), Berger and Protsch 1973:225. The fact that the Indo-Aryans lacked pigs from the very beginning of the Vedic period in India may indicate that they were influenced by some southern ethnic group which excluded pigs from the domestic animals they raised. (Cf. the Old Hittite division of ethnic groups into 'pig-eating' and 'non-pig-eating'.)

type (Calkin 1966:73-74, 132), which shows that Scytho-Sarmatian pig-raising has Proto-Iranian sources.⁷³

In eastern Europe, archeological finds from the first millennium B.C. show a significant increase in the role of pig-raising in a number of forest-steppe and forest areas; in these areas pigs are the most important type of livestock, outnumbering even cattle and horses (Calkin 1966:77). In Neolithic western Europe (second millennium B.C.) pigs are an important part of the livestock, outnumbering sheep; the ratio changes only in the late Bronze Age and the Iron Age, at the beginning of the Roman period (Clark 1952:117-18).

3.2.2.4. *The religious and ritual role of the pig as a fertility symbol among the ancient Indo-Europeans*

The Indo-Europeans' developed pig-raising culture and their large numbers of pigs are reflected in the religious role of this animal in various ancient Indo-European traditions. The most important symbolic meaning associated with pigs was fertility. Pigs — singularly fertile animals with numerous offspring — were sacrificed to fertility gods. Fertility is the main motif associated with pigs in the ancient Roman tradition. After the sacrifice of a pregnant cow (the ritual *Fordicidia*) to the earth goddess (*Tellūs*), a pregnant sow was sacrificed to the goddess of plant fertility *Cerēs*; in other rituals a pregnant sow (*sūs plēna*) was sacrificed to *Tellūs* (Dumézil 1966:240, 368-69, 584 et pass.).

The unusual fecundity of pigs may even have given rise to their name in Proto-Indo-European. The word for 'pig', **sū-*, may be cognate to **seu-* / **sū-* 'produce, give birth': Skt. *sū-* (masc., fem.) 'parent', 'sire, stud', 'dam' (in these meanings in the Rigveda), *sūte*, *sūyate*, *savati* 'gives birth, brings into the world', *sutá-* 'son',⁷⁴ Avest. *hav-* 'give birth, bring into the world', OIr. *suth* 'birth; fruit, fetus' (from PIE **suthu-*, cf. Skt. *sūtu-* 'pregnancy').⁷⁵ If the

73. A direct continuation of Scytho-Sarmatian pig-raising can be seen in historical times among the Ossetes, as is reflected in Ossetic in the presence of a number of technical terms for swineherding derived from *xoγ-* 'pig' (PIE **sū-*): *xoγdon* 'pigsty', *xoγgæx* 'swineherd' (cf. similar compounds with *su-* in various Greek swineherding terms).

74. In Sanskrit the name of the god *Savitṛ* (masc.) 'embodying power, giving life' (mentioned frequently in the Rigveda) is formed from the same stem.

75. The same root **sū-* produces a derivative in **-n-* meaning 'son': Skt. *sūnú-*, Avest. *hunu-*š, Goth. *sunus*, Olcel. *sunr*, OHG, OE *sunu* (Ger. *Sohn*, Engl. *son*), Lith. *sūnūs*, OCS *synŭ* 'son'; also cognate are Gk. *huiús*, gen. *huiéos*, Toch. B *soy* 'son', derivatives in **-yo-* from the same root.

A striking parallel to the overall etymological connection of PIE **seu-/sū-* 'give birth' and **sū-* 'pig' is also found in Kartvelian, where the roots **šew-*, **šw-* 'give birth, bring into the world' (Georg. *šv-ili* 'son', *-mšo* < **-m-šw-e*, Ming. *skua*, Svan *əmsge* 'son', Gamkrelidze 1959:58-59) and **šw-* 'pig, boar' (Georg. *e-šv-i* 'tusk', Ming. *o-sku* 'pigsty', see Klimov 1964:81) coincide formally and semantically with the Indo-European ones and stand in the same relation to each other. Of further interest is the comparison of OGeorg. *p'irmšo-* 'first-born'

word for 'pig' goes back to an originally verbal root, as is accepted by many comparativists, then it is clearly a native Indo-European word.

Roman tradition preserves both the archaic religious function of the pig as a fertility symbol and its place in the hierarchy of sacrificial animals. The sequence of sacrificial animals in archaic Roman tradition was given by the formula *su-oue-aurilia* 'pig-sheep-bull', in order of increasing importance. In the text of Cato discussing the sacrifice of unweaned animals (*suouetaurilia lactentia*), the sequence is *porcus-agnus-uitulus* 'piglet-lamb-calf'. This sequence of sacred sacrificial animals must reflect the significance and relative weighting of each animal in the economy. Interestingly, an analogous enumeration of sacred sacrificial animals in Sanskrit tradition does not mention pigs at all; their place is taken by goats (Dumézil 1966:238, 530). It is important that in cultures with developed swineherding that is dominant over sheepherding (as in many ancient Indo-European cultures, in particular early Slavic culture), the pig stands before the sheep in such listings (for East Slavic fairytales see Ivanov and Toporov 1974:39).

It can be concluded that the Romans preserved the ancient Indo-European practice whereby pigs, although they had an important economic function, were nonetheless ranked last in the hierarchy of relative economic weight, behind horses, bulls, and sheep. Of the Indo-European cultures known to us from archeological data, the Scytho-Sarmatian tribes of the northern Black Sea area in the first millennium B.C. are among the groups in which pigs in fact are the least important element in the livestock (Calkin 1966:74).

3.2.2.5. Dialect words for 'pig' and their connections to East Asian words

The dialect reflexes of Proto-Indo-European *sū- 'pig' include two interesting Greek variants: Gk. *hūs*, with the regular reflex of Indo-European initial *s- as the *spiritus asper* (cf. Gk. *huiús* 'son' from the same root), and Gk. *sūs*, Myc. *su-*, with an anomalous *s- reflex of IE *s-. The same two reflexes of initial *s- are also found in Greek derivatives of *saus-, *sus- 'dry': Gk. *aúō* 'I dry (something)', *haiōs* 'dry' beside *sausarós* 'dry'; cf. Skt. *śúṣyati* 'dries out', Avest. *huška-* 'dry', Lat. *sūdus* 'dry', Lith. *saūsas* 'dry', OCS *suxŭ* 'dry', Russ. *suxoj* 'dry'. Corresponding to this anomalous Greek reflex of initial *s-, Albanian has *th-* in these two words: Alb. *thi* 'pig', *thanj* 'I dry out' (the regular reflex of PIE initial *s- is Alb. *sh-*: Alb. *shoh* 'see': Goth. *saīhvan* and others); see Pisani 1959:102. These anomalous reflexes of initial *s- in Greek and Albanian, which produce doublet forms, can be interpreted as a trace of phonetic doublet forms in early dialects of Indo-European. A similarly

(from *p'ir-m-šw-e) and Skt. *pūrva-sū-* id. (going back to the Rigveda).

anomalous form in Latvian, *cūka* 'pig' (with initial affricate [ts]), is also of interest here. We can therefore reconstruct doublet forms for 'pig' in Indo-European: the basic form had initial *s- (with regular reflexes in most dialects), and a variant form had some special variety of initial *s-, perhaps an affricate, reflected in the initial s- of Greek, *th-* of Albanian, and *ts-* of Latvian.

That we can posit doublet forms for Proto-Indo-European *sū - 'pig' on purely internal evidence makes plausible the suggestion that Old Chinese *chu* ~ *tʃo 'pig' comes from an Indo-European source with an initial affricate (see Polivanov 1968). This could represent an Old Chinese borrowing from some ancient Indo-European dialect.⁷⁶

3.2.3. The cat

3.2.3.1. A migratory term for 'cat' in Indo-European dialects

Cognate words for 'cat' which go back to an old migratory term are attested in a number of Ancient European languages: OPruss. *catto*, Lith. *katė* 'cat', Latv. *kaķe* 'cat', ORuss. *kot*, Russ. *kot*, Pol. *kot*, LSorb. *kot*, Cz. dial. *kot*, Slovak *kot*, Bulg. *kótká* 'cat'; also Ir. *catt* 'cat', VLat. *cattus* 'wild cat'. The Baltic and Slavic forms are often considered loans from Vulgar Latin (see Vasmer 1964-1973:II.350). In that case we must posit separate Vulgar Latin borrowings into Baltic and Slavic: a Proto-Balto-Slavic borrowing (see Trautmann 1923:120) would present chronological problems.

The word for 'cat' is hard to distinguish formally and semantically from words meaning 'give birth (to small animals)': e.g. in Slavic, Russ. *kotit'sja* 'give birth' (of cats, sheep, rabbits, hares), Pol. *kocić się*, Cz. *kotiti se*, Serbo-Cr. *kòtiti (se)* id., and also adjectives: Russ. dial. *sukótnaja* 'pregnant' (of cats and other small animals), *sukotaja* 'pregnant dog', Serbo-Cr. *skòtna* 'pregnant' (of dogs and foxes), *kòt* 'brood, litter' (Trubačev 1960:97).

Slav. **kotiti (se)* 'give birth' (of small animals) is in turn etymologically related to such formations as Lat. *catulus* 'young of animal' (especially 'kitten', 'puppy'), *catula* 'small dog', *catulire* 'be in heat' (of dogs), OIcel. *haðna* 'kid goat', 'small goat', OHG *hatele* 'goat'. This shows that the whole set of words is fairly old. It is based on **khath-* 'cat', from which are derived verbs meaning 'give birth' (to small animals) and names for the young of small animals.

76. The borrowing of 'pig' into Chinese, like the borrowing of OChin. *k'iuwen* 'dog' from Indo-European (see 3.2.1.3 above), does not mean that the Chinese were previously unfamiliar with either animal. Indo-European cultural influence could have affected the economic and ritual functions of these animals in Chinese culture, with the consequence that the new borrowed word displaced the older native one.

3.2.3.2. *The religious role of the cat in individual Indo-European traditions*

The assumption that the term for 'cat' is ancient in this entire group of dialects, and not a recent loan from Vulgar Latin into Baltic and Slavic, is supported by the special religious significance of cats from earliest times in Baltic and Slavic traditions. In the ninth century A.D. the Great Moravian prince bore the name *Kocillū*, a derivative of the word for 'cat'; this agrees with the contemporaneous West Slavic legend of mice and cats. An analogously formed name is attested in the Italic tradition: *Catulus*, a cognomen of the Lutatia in Rome. This testifies to the extreme antiquity in Latin of the root *cat-* in the original meaning 'cat', 'give birth' (of small animals).

Even more conclusive information comes from the Baltic tradition, where Lithuanian mythological folklore texts frequently show the thunder god Perkunas or his opponent turning into a cat or another small animal (see Ivanov and Toporov 1974:77, 145). In ancient Germanic myth a cat lifted up by the thunder god Thor turns out to be the Cosmic Serpent.

All of this evidence testifies to ancient roots for the cultic significance of the cat, and hence the ancient status of its name, in this set of dialects. Since archeological evidence from eastern Europe in the first millennium B.C. shows that the domestic cat (*Felis domestica* Briss.) is infrequent (Calkin 1966:57), the cultic significance may reflect a more ancient cultural situation.

3.2.3.3. *Phonetic variants of the word for 'cat' and its relation to Near Eastern words*

In other ancient Indo-European dialects there is a phonetically similar word for 'cat' whose phonetic variation, however, does not permit it to be traced to the same root as **khath-*. Such words are found not only in ancient Indo-European dialects but throughout the Near East and the Caucasus as well. A comparison of Oss. *gædy* 'cat', Arm. *katu* 'cat' to Gmc. **kattuz* (OE *catt*, ME *catte* (Engl. *cat*), LGer. *katt* (Ger. *Katze*)) may point to a common ancient **k'at'-u-* with two glottalized consonants, which is non-canonical for Indo-European. The word may be considered a borrowed migratory term, represented in two forms in Indo-European dialects: **k'at'-u-* and **khath-*, with subsequent transformation in separate dialects (cf. also MGk. *kátta*).

The original territory of the domestic cat and the source of its name may be taken to be North Africa, where we find what must be the original word for 'cat' that underlies the migratory term:⁷⁷ e.g. Nubian *kadīs* 'cat'.⁷⁸ This is the

77. Ancient cultures of North Africa display motifs parallel to the Lithuanian myth of the thundergod turning into a cat: an example is the well-known Egyptian myth of the god Ra, who assumes the form of a cat and kills a serpent.

source not only of the Indo-European dialect words but also of words found throughout the Near East: Arab. *ḵiṭṭ-*, Aram. *ḵaṭṭā*; Georg. *k'a't'a*, Laz *k'a't'u*; Kabard. *gedu*, Adyghe *gedu*; Tabassaran *gatu*, Andi *gedu*, Dido *k'e't'u*, Avar *keto*; Turkish *kedi*. Given all these facts, the links between Near Eastern languages and cultures and the Indo-European dialects and traditions (Baltic, Slavic) located far from the Near East are striking.

3.2.4. Chickens, hens, and roosters

3.2.4.1. Areal terms for 'hen' and 'rooster' as onomatopoetic formations

An originally onomatopoetic term for 'chicken', 'hen', or 'rooster', derived from **kherkh-*, is attested in a number of Indo-European dialects. Its dialect distribution gives reason to consider it Proto-Indo-European: Skt. *ṛṇka-vāku-* 'rooster', Avest. *kahrka-* 'hen', Pehl. *kark* 'hen', Pers. *kark* 'chicken', 'hen', Gk. *kérkos* 'rooster', Mlr. *cercc* 'brood hen'; Toch. B *krañko* 'rooster'.⁷⁹

In its onomatopoetic character this word can be compared with innovated forms meaning 'rooster' in separate recent branches, based on words meaning 'sing', 'cry': Lat. *gallus* 'rooster' (cf. OCS *glasŭ* 'voice', Russ. *golos*); Goth. *hana* 'rooster', OHG *hano* 'rooster' (Ger. *Hahn*), OE *hæn* 'hen' (Engl. *hen*), OIcel. *hani* (these Germanic words are cognate to Lat. *canō* 'I sing'); OCS *kurŭ* 'rooster', Russ. *kur*, *kura* (cf. Lat. *caurire* 'growl', Skt. *kāuti* 'cries', 'roars'); ORuss. *pēt'l'* 'rooster', Russ. *petel*, *petux* 'rooster' beside Russ. *pet* 'sing'; etc.

Poultry raising was evidently weakly represented in the ancient Indo-European economy, which explains the fact that most terms for domestic fowl are developments in the individual branches and do not go back to Proto-Indo-European.⁸⁰ A number of such words are formed from the Indo-European terms for the respective ancestral wild birds, e.g. the terms for 'goose' and 'duck' discussed in II.2.3.7 above.

78. It is interesting that this word, found throughout virtually the entire Near East, should be missing in Egyptian, where the word for 'cat' is *mjw*, obviously onomatopoetic. In Egypt, where the cat was one of the main sacred animals, there was evidently taboo replacement of the original word by a euphemism of onomatopoetic origin. It is not impossible that similar factors may have led to the transformation or replacement of the original Indo-European word for 'cat'.

79. The word for 'chicken' in Hittite is unclear. The Sumerogram MUŠEN GAL (literally 'large bird') means 'chicken'. In Hittite tradition as in Roman tradition, poultry raising is evidently connected with ritual divination from birds (Lat. *auspicium*) and is not economically important: evidence is the Sumerogram LÚMUŠEN.DÛ 'poultry breeder', 'diviner from birds', literally 'bird-doer'.

80. For example, words for 'domestic pigeon' such as Lith. *balañdis* 'dove, pigeon', Oss. *bælon* 'domestic pigeon' are limited to a small dialect group (Abaev 1958:I.249); cf. also OCS *golqbi* 'dove', Lat. *columba* 'dove' (Vasmer 1964-1973:I.432-33), etc.

3.2.5. *Bees and beekeeping*3.2.5.1. *The Indo-European word for 'bee' and its taboo replacement*

A common term for 'bee' can be reconstructed with certainty only for one group of ancient dialects. The form is ***b^hē(i)-**: OIcel. *bý-fluga*, OE *bēo* (Engl. *bee*), OHG *bīa*, fem. *bini* (Ger. *Biene*) 'bee'.

Derivatives in ***-th-**: Lit. *bitė*, *bitis*, Latv. *bite* 'bee', OPruss. *bitte*; cf. Welsh *bydaf* 'beehive'.

Derivatives in ***-kh-**: OIr. *bech* 'bee', OCS *bīčela* 'bee', Lat. *fūcus* 'drone' (from ***b^hoi-kh-**),⁸¹ see Hamp 1971:184 ff.

If we admit taboo replacements of the initial consonant, we can extend this set to include Lat. *apis* 'bee', dim. *apicula*, and Skt. *mákṣ-* 'bee'. The latter is usually found adjacent to *mádhu* 'honey' in the Rigveda, and the change of initial ***b^h-** to *m-* in 'bee' is assumed to be due to the syntagmatic influence of 'honey' (but for another explanation of Skt. *mákṣ-*, Avest. *maxši-* 'fly' see Hamp 1971:184, 187).

Together with taboo reformations, in a number of dialects we find complete replacement of the original word for 'bee' by innovations derived from names of other insects (see Gauthiot 1910): Toch. A, B *kronīse* 'bee' (from PIE 'hornet' with semantic change, see II.2.2.8.1 above); Pehl. *wabz* 'bee, wasp', Baluchi *gvabz* 'bee, wasp', Oss. *ævz-*, *æfs-* 'bee'; Skt. *bambhara-* 'bee', Gk. *bombúlē* 'type of bee' (with semantic change from the original meaning 'gadfly', 'beetle', cf. Lith. *baṁbalas* 'horsefly', 'gadfly', Latv. *baṁbals* 'beetle'); Skt. *bhasalah*, *bhasanaḥ* 'bee' (cf. Gk. *psēn* 'wasp'); and others.

Another group of replacements is based on 'honey', sometimes 'honey fly': Gk. (Homeric) *mélissa* (from ***melitya**) 'bee' (cf. Gk. *méli* 'honey'); Skt. *madhu-māraka-* 'bee' (cf. *mádhu* 'honey'); Arm. *meṭu*, gen. *meṭui* 'bee' (cf. *meṭr* 'honey'); Oss. *mydybynz* 'bee', literally 'honey fly', Alb. *mjal-cë*, Arm. *meṭrčanč*, both 'honey fly' (see Mann 1948:288, Abaev 1973:II.136, Tumanjan 1978:201, 300, 301).

3.2.5.2. *Indo-European terms for 'honey' as evidence for the antiquity of beekeeping among the Indo-Europeans*

Despite the restricted dialect attestation of the original Indo-European word for 'bee', there can be no doubt that beekeeping and the word for 'bee' are Proto-

81. Lat. *fūcus* could also go back to ***b^hou-kh-**. The zero grade of this form may underlie Slav. ***būčela** 'bee' (OCS *būčela*), ***bučati** 'buzz, hum' (Russ. dial *bučat'* 'buzz, hum', of bees, Filin 1965:III.328), see Trubačev 1974:III.105. The Hittite word for 'bee' is unknown; texts use the Sumerogram NIM.LĀL.

Indo-European, in view of the antiquity of the word for 'honey' in Indo-European, the developed beekeeping economy among the Indo-Europeans, and the religious significance of the bee in all the ancient Indo-European traditions.

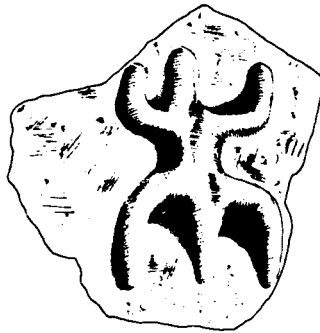


Illustration 12.

Cultic depiction of a bee. Ancient Balkan culture,
5th millennium B.C.

Two ancient words for 'honey' are reconstructed for Proto-Indo-European, with partly overlapping dialect distribution: **mel-i-th-* and **medhu-*.

Forms from **mel-i-th-*: Hitt. *melit* 'honey' (Sumerogram LÂL-it), Luw. *mallit-*, instr. *mallitati* 'honey', Pal. *malit-* 'honey'; Gk. (Myc.) *me-ri-* 'honey', (Hom.) *méli*, gen. *mélitos* 'honey' (with the archaic derivative *blíttō* 'cut, trim honeycombs'); Arm. *mełr*, gen. *mełu*; Lat. *mel*, gen. *mellis*; OIr. *mil*, gen. *mela*, Gaul. *Meliddus* (personal name), cf. Hitt. *milittu-* 'sweet', Welsh *melyn* 'yellowish' (literally 'honey-colored'), Goth. *miliþ* 'honey', OE *milisc* 'sweet as honey'. In its derivative type the word appears archaic, with the marker **-th-* and traces of heteroclitic inflection in **-i-/*-u-/*-n-*: e.g. Lat. gen. *mellis* < **mél-n-es*, Arm. gen. *meł-u*. The word is attested in all the Anatolian languages, in Greek-Armenian, and in Italic-Celtic-Germanic, a distribution that makes it Proto-Indo-European.

The other term, **medhu-*, has the meaning 'mead' in several branches: Skt. *mádhu* 'honey', 'sweet intoxicating beverage' (extended to beverages other than mead in Vedic); cf. Skt. *madh(u)v-ád-* 'honey-eater', Avest. *maðu-* 'wine, mead' ('the drink of bears'), Oss. *myd* 'honey', Sogd. *mōw* 'wine', Pers. *may* 'wine'. Gk. *méthū* 'sweet beverage', 'wine' (in Homer), Hom. *methúō* '(I) drink my fill, get sated' (with wine, fat, etc.). OCS *medŭ* 'honey' (cf. Slav. **medvěď* 'bear', literally 'honey-eater'), ORuss. *med* 'honey', 'intoxicating beverage', Lith. *medūs* 'honey', Latv. *mēdus* 'honey', 'beverage', OPruss. *meddo*. OIcel. *mjǫðr* 'mead'; OE *meodu* (Engl. *mead*), OHG *metu* (Ger. *Met*). OIr. *mid*, gen. *medo* 'mead', Mlr. *medb* 'intoxicating', Welsh *meddw* 'intoxicated'. Toch. B *mit* 'honey'. In view of its dialect distribution (Indo-Iranian-Greek, Celtic, Balto-

Slavic-Germanic, Tocharian), the word can be considered Proto-Indo-European.⁸²

The fact that both ***melith-** and ***medhu-** are Proto-Indo-European permits us to detect in them a semantic distinction found in some branches which must also go back to Proto-Indo-European. The dialects which preserve both forms give the most conclusive evidence. In such dialects ***melith-** (Gk. *méli*, Goth. *miliþ*, OIr. *mil*) means specifically 'honey', while ***medhu-** (Gk. *méthu*, OIcel. *mjqðr*, OIr. *mid*) means only 'mead (or wine)'. In dialects which have only ***medhu-**, it means both 'honey' (Indo-Iranian, Balto-Slavic, Tocharian) and 'mead'; from 'mead' it develops the meaning 'wine' in a number of dialects, with subsequent loss of the meaning 'honey' (e.g. Gk. *méthu*, Pers. *may*, etc.). Importantly, in dialects which have only ***melith-**, it means only 'honey', 'sweet substance', and never refers to beverages.

This correlation must reflect the Proto-Indo-European semantics of ***melith-** and ***medhu-**. While ***melith-** meant specifically 'honey', ***medhu-** could also refer to beverages made from honey. These terminological subtleties pertaining to honey and its use testify to the significance of beekeeping in the ancient Indo-European economy. This is consistent with cultural data from those early Indo-European groups that had highly developed beekeeping, and with the special ritual and mythological significance of bees and honey in ancient Indo-European tradition.

3.2.5.3. *Beekeeping and its religious role as reflected in ancient Indo-European tradition*

In the Old Hittite Laws, special articles deal with bees and beehives (§§91-92) and state damages for the theft of swarming bees (NIM.LÁL^{HI}A-*an kammari*) and beehives (É.NIM.LÁL) both in ancient customs and in later juridical practice. Also mentioned are specialized beekeepers (Sumerogram LÚ NIM.LÁL 'bee man').

Bees have a special role in Hittite mythology, and honey is significant in Hittite rituals. In the myth cycle about a god who disappears and returns (Telepinus, the thunder god, the sun god), after unsuccessful searches for the lost god, who has taken fertility away with him, the mother goddess (*Ḫannahanna-*) sends a 'little (*ammiyant-*) bee' out to search for him. The bee is to find the god, sting him, spread wax on his eyes and hands, sanctify him, and bring him back. Only this 'little bee' manages to find the god and bring him back together with

82. PIE ***medhu-** may also be preserved in relic form in Anatolian, in Hitt. ***middu-** (Luw. *maddu-*) in the city name *Midduwa*; this corresponds to Late Hitt. *Meliddu* (mod. *Malatya*), etymologically related to Hitt. *melit*, Luw. *mallit* 'honey' (see Durnford 1975:49).

fertility. At this point a rite is performed to appease the god with invocations calling on him to soften like wax, honey (*melit*), and milky juice (*galaktar*), see Haas 1977:85ff. Such invocations apparently reflect an ancient Common Anatolian practice of appeasing a god or an evil spirit by comparing him to honey (Luw. *mallit-*), e.g. Luw. *malitiya-aš ayaru* 'may he become honey' (KUB XXXII 8 + 5 III 27 et pass.).

In ancient Greek tradition the earliest evidence for sacral use of bees and honey goes back to the Mycenaean period. Mycenaean texts mention numerous 'servants of honey' ('of bees?'), *me-ri-da-ma-te* (**melí-damar*, Lejeune 1958:195). In Homer, ritual use of honey mixed with milk (*melí-krētos*) is attested in the sacrifice to 'all the dead' (*pāsin nekúessin*). Three drinks are poured out to them: first a sacrifice of honey with milk (*melikrētōi*), then 'sweet wine' (*hēdēi oínōi*), and 'in the third place water' (*tō trítōn aūth' húdati*) (Odyssey 11.26-28). The Odyssey describes the stone cave of the naiad nymphs, who weave on stone looms, as having stone vessels in which 'bees nest' (*tithaibōssousi mélissai*) (Odyssey 13.106). The stone vessels metaphorically represent beehives, as is supported by the same metaphorical image of stone looms (*histōi lítheoi*, Odyssey 13.107).

The tradition of Homeric times where female deities are mentioned together with bees that nest next to them is apparently also reflected in later motifs associated with the temple of Artemis in Ephesus (Asia Minor). The bee was the cult symbol of the supreme female deity Artemis (and elsewhere in Asia Minor also of Cybele), whose priestesses were called bees (*melissai*) and whose entire temple was compared to a beehive (see Ransome 1937).

The regular connection of bees with female divinities may be evidence that beekeeping was primarily the occupation of women, originally and in later stages of early beekeeping. There are also interesting similarities between the complex of notions about bees in Ephesus and the myth of the Amazons (Toporov 1975a:36-37).

In Sanskrit tradition, honey (*mádhu*) is presented in the Rigveda as a divine drink of immortality (*amṛta-* in combination with *mádhu*). Archaic hymns in praise of honey in the Rigveda preserve ancient formulas which are close to the Anatolian ones mentioned above and which therefore reflect Proto-Indo-European tradition and usage. E.g. in the Rigveda, I, 90, 6-8:

mádhu vātā ṛtāyaté mádhu kṣaranti síndhavaḥ
mādhvīr naḥ santv ósadhīḥ
mádhu náktam utóśaso mádhumat pārthivaṃ rájaḥ
mádhu dyáur astu naḥ pitá
mádhumān no vánapátir mádhumāñ astu sūryaḥ
mādhvīr gāvo bhavantu naḥ

'The winds bring sweet (rewards) to the sacrificer;
 the rivers bring sweet (waters).
 May the herbs yield sweetness to us.
 May night and morn be sweet; may the region of the
 earth be full of sweetness;
 May the protecting heaven be sweet to us.⁸³
 May Vanaspati be possessed of sweetness towards us;
 may the sun be imbued with sweetness;
 May the cattle be sweet to us.'

(Wilson 1866:231; note that every instance which Wilson
 renders 'sweet' is literally 'honey' in the original)

In some Iranian cultures a developed beekeeping tradition with ancient features, ancient terminology, and a bee cult associated with a goddess is preserved in relic form to the present day. Ossetic customs include an archaic beekeeping tradition with a special protecting goddess, and Ossetic folklore testifies to the role of the ancient mead beverage called *rong* in Ossetic (see Abaev 1949:I.61).⁸⁴

The historical Indo-European traditions of Europe preserve a whole complex of early mythic conceptions of honey and bees, which largely coincide with those of the oldest Indo-European groups. Preparation of a beverage from honey among the Germanic tribes is attested in the writings of classical authors: Pytheas, who visited Thule (Scandinavia) in the fourth century B.C., and Tacitus. The Edda is permeated with mythological motifs concerning honey and mead. In Old Icelandic myth, these two, together with milk, are the most important drinks of the dead in Valhalla, which is reminiscent of the Homeric Greek custom of offering honey mixed with milk to 'all the dead'. The female mythic figures of the Edda (*Völva*, *Gullveig*, *Gunnlǫð*, and others), like the supreme deity Odin, obtain honey and drink a honey beverage that gives them wisdom, knowledge of the runes, and the gift of poetic language (see Meletinskij 1968:169ff.). Further evidence for the importance of bees and honey among the Germanic tribes are personal names which include the words for 'bee' and 'honey': OE *Bēowulf* 'Bee wolf', i.e. 'bear', OIcel. *Gullveig*, literally 'golden drink', and others.⁸⁵

83. Cf. the parallel usage in Luwian ritual: *malitiya-aš ayaru* 'may he become honeyed, honey-bearing'; also the Hittite rite in the Telepinus myth.

84. The Ossetic reflex of **medhu-*, Oss. *myd*, means only 'honey'; the original meaning 'mead' has been taken over by a new word, *rong*, from OIran. **frāna-* 'soul, breath, life force' (cf. Skt. *prāṇa-*), Abaev 1973:II.421-22. East Slavic has an analogous innovation: ORuss. *syta* 'water sweetened with wine', 'boiled honey' (Sreznevskij 1958:III.877, Vasmer 1964-1973:III.820) beside Pol. *woda miodem nasyciona* 'water saturated with honey'.

85. For the role of bees and bee swarms in ancient Germanic myth and rites see also Spamer 1978.

The ancient Balts preserved a god specifically of bees and honey, Bubilas (Toporov 1975a:17-18, 23), who corresponds to the 'bee god' of the East Slavs who was later identified with Saint Zosima. Numerous traces of bee worship are preserved in Baltic and Slavic folklore: bees occupy the center of the Cosmic Tree; bees symbolize the beginning of spring and fertility; and so on.

3.2.5.4. The typology of methods of obtaining honey and types of beekeeping among the ancient Indo-Europeans

A comparison of the historical traditions pertaining to bees and honey allows us to conclude that by the earliest stages in the individual development of the Indo-European branches beekeeping was an essential element in the economy. Beehives are recorded as part of the property of individuals among the earliest Hittites. Evidence from Homeric Greek points to the presence of hives and domestic bees.

Three stages can be distinguished in the evolution of beekeeping: (a) primitive honey-gathering; (b) sylvestrian beekeeping in hollow logs; and (c) domestic apiculture. The earliest, most primitive form involves getting honey and wax from wild bees which live in hollow trees. Ancient pictorial evidence of this method is a cave painting from the Alpera cave (eastern Spain, seventh millennium B.C.), which shows a woman carrying a jug, climbing a tree and collecting wild honey, surrounded by flying bees (Clark 1952:34; see Illustration 13). A roughly contemporaneous (seventh to sixth millennia B.C.) parallel



Illustration 13.
Cave painting from Alpera, 7th millennium B.C.

comes from the other end of the Mediterranean area, Çatal Hüyük in Asia Minor, where bees and honeycombs are shown as major attributes of a female deity (Mellaart 1967): see Illustration 14.

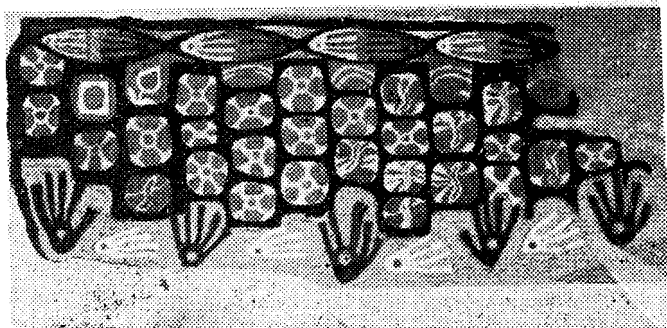


Illustration 14.

Depiction of honeycombs. Çatal Hüyük, 7th–6th millennia B.C.

It is in the Mediterranean area that the transition from primitive beekeeping to the more evolved types first takes place. Here we find the second stage, sylvestrian beekeeping, where bees are kept in the forest, in specially carved hollows in trees or in hollow logs set up in forest apiaries; we also find the third stage, domestic apiculture, where domestic bees are kept in manufactured hives near the household.

Domestic (apiary) beekeeping is assumed to have been known in Egypt, beginning with the third millennium B.C. In Egypt, as in ancient Indo-European traditions, an intoxicating beverage was prepared from honey; it was called by the same name *bj.t* as ‘bee’ and ‘honey.’⁸⁶ Also known is the special title of ‘bee-master’, *bj.tj* (Erman and Grapow 1955: I.434); cf. Hitt. LÚ NIM.LÁL ‘apiarist’. In Egypt, not only honey but also beeswax (*mnḥ*) was used, in particular in religious rites. The eyes, nose, and mouth of a mummy were closed with wax; death masks were made of wax. This custom finds a striking parallel in the Hittite myth of Telepinus, where a bee spreads wax on the eyes and hands of the ‘sleeping’ Telepinus.

3.2.5.5. Indo-European terms for ‘beehive’ and ‘wax’

Despite the significance of bees and beekeeping in Egypt, there is a striking lack of any word meaning specifically ‘beehive’. Among the Indo-European dialects

86. Another Egyptian word for ‘honey’, *ḥd.t*, also means ‘sacrificial beverage’, ‘milk’, and metaphorically ‘eloquence’ (Erman and Grapow 1955: III.211); this shows that milk and honey were highly significant and very plentiful, since they could be equated to eloquence. This image is highly reminiscent of the Indo-European conceptions of honey and milk, honey and eloquence (‘the honey of poetry’), well preserved in ancient traditions.

we find the same lack of any cognates that would make possible a reconstruction of a Proto-Indo-European word for 'beehive'.⁸⁷ This might seem to suggest that Indo-European beekeeping was still of the sylvestrian beekeeping type, where semi-wild bees were raised under natural conditions in hollow trees in the forest. But this is not the only possible conclusion, in view of the fact that many cultures with well-developed apiculture nonetheless have no special word for 'beehive' but express the notion descriptively: e.g. the Sumerogram É.NIM.LÁL 'bee house', Oss. *mydy k'yrğæd*, literally 'honey chest', cf. Ger. *Bienenkorb*, literally 'bee basket', etc.⁸⁸

Also notable is the extreme dialect restriction of the common word for 'beeswax', for which there are cognates only in Baltic-Slavic-Germanic: OHG *wahs* (Ger. *Wachs*), OE *weax* (Engl. *wax*), Olcel. *vax*; Lith. *vāškas*, Latv. *vasks*, *vaska*, Russ. *vosk* (Stang 1972:61).⁸⁹ Even the early stages of beekeeping presuppose familiarity with beeswax and its use in the household and in ritual, and given what is known about Indo-European beekeeping the Indo-Europeans must have made and used wax (as is clearly reflected in ancient Indo-European traditions). From this we can conclude either that the dialectally restricted term for wax continues an ancient Indo-European word (just as the ancient term for 'bee', **bhei-*, is essentially limited to the same dialect group); or that the word is an innovation which replaced the original term, lost in all surviving historical traditions.

3.2.5.6. *The direction of spread of beekeeping and the connection of Indo-European and Eurasian beekeeping terminology*

The original center of beekeeping in the seventh to third millennia B.C. was the

87. Terms meaning specifically 'hive' are restricted to small dialect groups: Lith. *aulys*, Latv. *aūlis*, Russ. *ulej* 'hive', which means 'hollow' elsewhere in Indo-European (Gk. *aulós* 'hollow core', Norw. dial. *aul* 'pipe; stalk'); Lat. *alueus* 'trough; hollow, hive' is semantically similar to the Balto-Slavic term. Old Prussian *drawine* 'hive' is formed from the original term for 'tree'; the cognates Lith. *dravis*, *dravė* (cf. *drevėti* 'trim hives', Būga 1958-1961:III.206) and Latv. *drava*, *dreve* mean 'cavity, hollow in a tree'; cf. also Russ. *drovina* 'log, block' (Toporov 1975-:I.372).

A term for 'cavity, hollow carved in a tree for bees' is found in the same dialect area: Slav. **būriti*: ORuss. *b"rit* 'log for bees; tree with a beehive in it', Pol. *barć*, OCz. *brt* 'cavity, hive', Slovene *brt* 'tree with a carved hollow for bees'; possibly also related is Lith. *būr-tv-is* 'sorcerer, magician' (with semantic transfer), Trubačev 1974-:III.132-33.

It is interesting that precisely these Indo-European dialects, which in historical times are far from the Near Eastern center of beekeeping, should have preserved (and partially renewed) the beekeeping terminology: it is in these dialects that we find the terms for 'bee', 'mead', 'hive', etc.

88. Note also that in ancient Greece special woven baskets were used as beehives.

89. There is an interesting comparison of this set of words with Oss. *myd-až* 'wax', where -*až* comes from **waž* (see Abaev 1973:II.135). This **waž* can be compared with the Balto-Slavic-Germanic term for 'wax', with Oss. *ž* possibly corresponding to *-*sk-*, *-*ks-*.

Mediterranean region in the broad sense, with especially well-developed domestic beekeeping in ancient Egypt of the third millennium B.C. This area gradually expanded to the north and west. In this connection, the similarity of PIE ***bhei-** 'bee' to Egyptian *bj.t* (with the feminine gender marker *-t*) is striking. In the same area from earliest times the bee has the special religious and ritual role of a female deity or fertility god. This is reflected in many ancient Indo-European traditions (Old Hittite, ancient Greek, and others) as well as in adjacent non-Indo-European areas. In the Transcaucasus, where beekeeping has ancient roots, there is a widespread cult of a female deity who is the protector of bees and beekeeping. In Svan she is known as *Lamaria* (see Charachidzé 1968:486ff.; other Svan deities with analogous functions are *žgərāg-Lenčaš*, *Bav-bednieri*), in Mingrelian *žgeraguna*, in Abkhaz *Ananagunda*, in Circassian *Merisa*, etc. (see Robakidze 1960:175, Lekašvili 1979). There is also a Svan ritual *Melia-t'elepia*, strikingly similar in its motifs to the myth of Telepinus from Asia Minor (Bendukidze 1973).⁹⁰ The same tradition of bees and fertility goddesses from Asia Minor, which ultimately goes back to Hattic tradition (Hatt. *Talipinu*), must have influenced the Greek myth of Telephos who was nursed by Artemis and is connected with parallel motifs (Toporov 1975a:37ff.).

For a long period of time, extending up to the first millennium B.C., beekeeping was restricted to the Mediterranean and the Near East. Its subsequent eastward spread can be followed in the migrations of the relevant terms. The Indo-European term for honey is found in Old Chinese by the fourth to third centuries B.C. in the form **mǐět* 'honey', which can be related to Indo-European words for honey such as Toch. B *mit* < **myät* < **medhu* (see Polivanov 1916, Conrady 1925). The word entered East Asia together with honey and beekeeping, brought in by the Indo-European tribes who migrated eastward.

As the beekeeping Indo-Europeans migrated into Central Asia, the same word for 'honey' may have been borrowed into Finno-Ugric languages in the form **mete*: Hung. *méz*, Finn. *mesi*, Mordv. *med'*. The Finnish epic, the Kalevala, contains motifs strikingly similar to the Telepinus myth: the hero Lemminkainen, killed by his enemies, is brought back to life with 'magical honey' carried from the ninth heaven by a bee acting on the request of Lemminkainen's mother.

90. The Kartvelian term for 'bee', **bui'k'ar-* (Georg. *put'k'-ar-i*, Laz *bui'k'už-i*) bears a striking phonetic similarity to the Indo-European derivations in **-kh-* and **-th-* from the term for 'bee': **bhoi-kh-el-* ~ **bhou-kh-el-* (Slav. **bīčela* ~ **bŭčela*, Lat. *fūcus*); **bhi-th-* (Balt. **bit-*).

Chapter Four

Indo-European plant names. Uses of plants; their ritual and cultic functions in ancient Indo-European culture

4.1. Flora: Trees

4.1.1. *Tree, oak*

4.1.1.1. *The position of trees among the flora*

The flora, characterized by the feature of inanimacy, included various species of trees as well as herbs and grasses, cereals, and flowers. Within these, wild plants were distinguished from cultivated ones. Comparative analysis of the words for these plant species yields a reconstruction of various ancient plant and tree names and concepts associated with them.

4.1.1.2. *Proto-Indo-European 'tree', 'oak'*

The Proto-Indo-European word meaning 'tree', or in some dialects 'oak', is represented by a base with alternating forms **t'e/orw-* / **t're/ou-*, attested in all the main dialects:

Hitt. *taru* 'tree', Skt. *dāru* 'tree' (gen. *dróḥ, drúṇaḥ*), *drú-* 'tree', *dravya-* 'wooden', *drumá-* 'tree'; Avest. *dāuru-* 'tree trunk', *drvaēna-* 'wooden'.

Myc. Gk. *du-ru-to-mo* 'woodcutters' (Gk. *dru-tómoi*), *do-we-jo* 'wooden' (**dorweyos*), Hom. *dóru* 'tree trunk, tree; spear shaft', gen. *dourós*, archaic *douratos* < **dorwntos*; *drūs*, gen. *druós* 'tree, oak', *tà drumá* 'oak forest' (Homer), *déndreon* 'tree' (reduplication: **der-drewon*), Att. *déndron*; Maced. *dárrulos* 'oak'.

Alb. *dru* 'tree', *drush-k* 'oak'.

OIr. *daur*, gen. *daro* 'oak', *daurde* 'oaken', *derucc* 'acorn', Gaul. **d(a)rullia* 'oak' (cf. Maced. *dárrulos*), Welsh *derwen* 'oak'.

Goth. *triu* 'tree', OIcel. *tré*, OE *trēo* 'tree' / *treow* 'truth, promise, favor', OSax. *trio* 'tree, log'.

Lith. *dervà* 'pine', *darvà* 'pitch', Latv. *daŗva* 'pitch', OCS *drěvo* 'tree, log', Russ. *derevo* 'tree', *drom* 'thicket, undergrowth, windfallen wood'.

Also part of this set is Toch. A, B *or* ‘tree’, where the absence of the initial consonant is not fully understood.¹

4.1.1.3. *The semantics of PIE *t’e/orw-, *t’re/ou- as reflected in the meanings of the descendant cognates*

The meaning ‘oak’ is attested in two different ancient dialect areas (in Celtic and in Greek, Macedonian, and Albanian), which allows this meaning to be reconstructed for the Proto-Indo-European form. In addition, we can also reconstruct the meaning ‘tree’, ‘wood’ on the evidence of Hittite, Tocharian, Indo-Iranian-Greek, and Baltic-Slavic-Germanic. The fact that the meanings ‘tree’ and ‘wood’ are regularly associated indicates that the word belonged to the inactive class. The heteroclitlic inflection of the term, **-u-/*-n-th-* (cf. Gk. gen. *doúratos*, Skt. *drūṇaḥ*), marks its formal membership in the inactive class; nouns of this type subsequently acquired neuter gender.

Accompanying the primary meaning ‘tree, wood, oak’ is the meaning ‘hard, strong’, evidently based on the characteristics of oak wood:² Skt. *dāruṇá-* ‘solid, strong’, Arm. *tram* ‘solid’, Lat. *dūrus* ‘hard, strong’ (from **druros*); OIr. *dron* ‘strong’; OE *trum* ‘hard, strong, healthy’, Lith. *drūtas* ‘strong, solid’, OCS *sŭ-dravŭ* ‘healthy’, Russ. *zdorovyj*. The hardness and solidness of oak wood may have given rise to the range of notions ‘true’, ‘firm’, ‘steadfast’, ‘trust’ expressed by the cognates, especially in Germanic: Goth. *triggws* ‘true’, OHG *gi-triuwi* (Ger. *treu*), OIcel. *tryggr* ‘true’; Goth. *trauan* ‘trust’, OE *trūwian*, OHG *trū(w)ēn* (Ger. *trauen*) ‘trust’, etc. (Osthoff 1901:I; but see also Benveniste 1966a:298-301, P. Friedrich 1970:141-43). This meaning may also be linked to the meaning ‘faith’ carried by the word in a broader dialect area: OIcel. *trú* ‘faith’, OPruss. *druwis* id.

4.1.1.4. *Indo-European ‘oak’ and ‘cliff, rock’*

In contrast to the neuter noun ‘oak, tree’, formerly an inactive noun, there is another Indo-European stem **pherkhou-*, also ‘oak’, which clearly belonged to the active class of nouns and subsequently acquired non-neuter gender. It is notable that this noun means ‘oak’ and ‘forest’ but never ‘wood’: Lat. *quercus*

1. The same correspondence of Toch. Ø- to *d-* in other dialects (e.g. Greek) is found in another word: Toch. A *ākār*, pl. *ākrunt* ‘tear’ : Gk. *dákru*, Lat. *dacruma* ~ *lacruma* (Hamp 1972a). Sanskrit and Baltic show forms analogous to Tocharian: Skt. *ásru* ‘tear’, Lith. *āšara*. It is interesting that, in this word as in ‘oak’, Latin and Sanskrit show phonetic departures from the usual reflexes of **t*: Lat. *larix* ‘larch’, Skt. *tarú-* ‘tree’ (beside normal Skt. *dāru*).

2. Wood, when designated by this word, is compared to stone (on the basis of its hardness): Hom. *apò druòs oud’ apò pétērēs* ‘from neither oak nor stone’, Iliad 22.126; in comedy, *Dru-akharnēs* ‘the Achaeans, hard as oak’; and elsewhere (P. Friedrich 1970:141).

'oak'; Celt. *Hercynia silva* 'Hercynian forest' (in Latin transmission; cf. in Aristotle *Arkúnia órē* 'Mt. Arcynia': Holder 1961-1962:I.1458ff.), *hérkos* 'oak forest' (transmitted via Greek); OE *firgen* 'mountain forest'; Langobard. *fereha* 'oak species', OHG *Fergunna*, mountains in central Europe, cf. MHG *Virgunt* 'mountain forest; the Sudetes'; OIcel. *fjǫrr* 'tree'; OHG *forha* 'pine', OE *furh* 'pine', OIcel. *fura* 'pine', *fýri* 'pine forest', Ger. *Forst* from **forh-ist* 'pine forest'; Skt. *parkaṭī* (variant *plakṣá-*) 'fig sp., *Ficus infectoria*' (Turner 1966), cf. Panjabi *pargāi* 'holly oak, *Quercus [ilex]*'. Based on its dialect distribution (Celtic-Italic-Germanic, Indic), this set of terms for 'oak' is very ancient, going back to Proto-Indo-European.

The semantics of the term clearly points to a connection between 'oak' and mountainous regions, which is the basis for the Ancient European term applied to forested mountains (from the Sudetes to the Carpathians, see preceding paragraph). Cognates mean 'mountain': Goth. *faírgunni* 'mountainous region' (cf. OHG *Fergunna*). These terms are related to words meaning 'mountain', 'cliff, rock' going back to the same root but without the **-k^{ho}-* suffix: Skt. *párvata-* 'cliff, mountain' (frequent in the Rigveda); Hitt. *peru* (nom.-acc. neuter), dat. *peruni* 'cliff, rock' (Eichner 1973:75, 98); *peruna-* id. (non-neuter). The Sanskrit-Hittite agreement shows that the word is Proto-Indo-European. Hence we can distinguish two variants of this word for Proto-Indo-European: a stem with **-k^{ho}-*, **pherk^{hou}-*,³ and one without **-k^{ho}-*, **pheru-*.

4.1.1.5. The oak-deity connection

These two stems were originally variants of a single word, as is clearly shown in names for a thunder god who was linked with oaks and cliffs in ancient Indo-European mythic traditions. These terms are derivatives in **-n-o-* from one or the other of the two stems **pherk^{hou}-* and **pheru-*. Dialects showing the **-k^{ho}-* suffix are the following: Baltic, where the Proto-Baltic thunder god, Lith. *Perkúnas*, Latv. *Pērkūns* (cf. also Lith. *perkūnija* 'thunderstorm', OPruss. *percunis* 'thunder'), is connected with oaks and oak groves (cf. the terms for sacred trees, Lith. *Perkūno ąžuolas*, Latv. *Pērkuona užuols* 'Perkun's oak')⁴ and also with mountains, cliffs, and stones (cf. Lith. *Perkūnkalnis* 'Perkun's mountain', the popular belief that a mountain was Perkun's ancient habitation, etc.). Germanic: OIcel. *Fjǫrgyn* 'mother of the thunder god Thor' (a feminine stem in *-uni*, the same type as in Celtic *Hercynia silva*, Lith. *perkūnija* 'thunder'). Indic: Skt. *Parjanya-*, god of thunder and storms in the Rigveda; the term

3. The Italic form from **pherk^{hou}-* shows subsequent assimilation of **perk^{wu}-* to **k^werku-*, Lat. *quercus* 'oak' (cf. also Venet. *Quarquēni*, tribe name, literally 'Oak People').

4. The ancient term for oak in Baltic is replaced by a neologism, Lith. *ąžuolas*, Latv. *užuols*, OPruss. *ansonis* 'oak' (Toporov 1975:I.93).

probably shows subsequent voicing of the reflex of ***k^{ho}** analogous to ORuss. *peregynja* (name of a mythological being, cf. Jakobson 1970:612).

Dialects showing the name of the same deity without the ***-k^{ho}-** suffix: Slavic, where the Common Slavic thunder god ***Perunǔ** (Ukr. *perun* 'thunder', Beloruss. *pjarún*, Czech *perun* 'thunder', Pol. *piorun* id.) is connected with oaks and mountains (ORuss. *Perunov* "dub"⁵ 'Perun's oak', located on a mountain: Ivanov and Toporov 1974:14ff., Nagy 1974). Albanian *Perën-di* 'god, sky' (Pisani 1959:124), especially in songs praying for rain. Hitt. *Perunaš* 'Rock, Cliff' (a woman who gave birth to the son of the god Kumarbi, in the Song of Ullikummi I.1.14); the Old Hittite god *Perwaš*, whose name is derived from the same root, is connected with the cliff ÉNA₄ *ḫegur* D*Perwa-* 'the mountaintop house of the god Pirwa'. The Kafir name of the war god *Pärün* (cf. also the term for the Pleiades in Pashto: *Pērūne*, Scherer 1953:142; cf. Jakobson 1970:612).

The connection between the Proto-Indo-European thunder god ***pher(k^{ho})u-n-** and terms for 'mountain oak', 'oak forest on mountaintop', 'mountain', 'cliff', ***pher(k^{ho})u-**, can be explained if we assume the ancient mythological pattern of lightning as striking great oaks on mountaintops. This view must reflect some recurrent feature of the mountainous region inhabited by the ancient Indo-European tribes.

4.1.1.6. Species of oak and mountain oak in Eurasia

There are several varieties of oak (*Quercus* L.) found throughout western Eurasia, primarily in areas of moderate and southerly climate. In Asia Minor, including the Transcaucasus, several species of oak are found: the Iberian oak (*Quercus iberica*), the (European) Turkey oak (*Quercus cerris*), the Persian oak (*Quercus macranthera*), the holly oak of southwestern Asia (*Quercus ilex*), the Imeretian oak (*Quercus imeretina*), and others (see Berg 1955:241, 244, 265, 289 et pass.).

During the Atlantic period (roughly the seventh to fourth millennia B.C.), oak forests spread throughout Europe, including the northern Black Sea coast region (Nejřtadt 1957:302). Later, in the Lusatian culture of the first millennium B.C., over half of the wood used in construction was oak (Firbas 1949:169). During the Subboreal (3300-400 B.C.), coniferous and birch forests replaced oak forests in the more northerly regions, and oak forests played a subordinate role compared to pines (Clark 1953:26). Hence it is no surprise that in the early history of the Germanic languages the ancient term for mountain oak and oak forest shifts to denote conifers and coniferous forests. (The

5. In Common Slavic the ancient term for oak is replaced by a neologism (Russ. *dub*, ORuss. *dub*"), cf. Vasmer 1953:1.376-77 [1964-1973:I.547-48].

original meaning is preserved in Celto-Germanic in the ancient name for the Sudetes and Carpathians as 'mountainous oak forests'.)

In the high mountains of Southwest Asia (in the broad sense, i.e. including the Transcaucasus, Iran, and Afghanistan), which represent the most ancient center of dispersion of oaks and oak forests, the oak is the basic element of the landscape.⁶ In mountain regions of this area, up to an elevation of ca. 2300-2600 meters, deciduous forests are composed primarily of huge oaks, many of which are killed by thunderstorms and the lightning that strikes frequently in these areas.⁷ Lightning striking this strongest of trees, as well as cliffs and rocky mountaintops, would naturally have evoked the image of an all-powerful thunder deity who bore the name of the mountain oak.

4.1.1.7. The cultic role of the oak in the cultures of Southwest Asia

The oak is considered sacred throughout much of the Near East. An oak cult is attested throughout the Caucasus. This is especially characteristic of Kartvelian tradition, where Pshav and Khevsurian mountain people preserve a tradition of praying to an oak spirit (Džavaxišvili 1960:I.86). The oak is conceived as a great mythic tree, in essence the Cosmic Tree, with its top linked to the sky by a golden chain, by which angels ascend to heaven (in the poet Vazha-Pshavela). In Abkhazia, it is believed that the thunder god strikes oaks during thunderstorms, and hence oaks are uprooted if they grow near houses. Oaks and mountains, especially mountain passes, are places where especially strong oaths are taken (Malia 1970:90ff.). Similar conceptions of oaks are prevalent among the Ossetes: oaks (Oss. *tūlʒ/tolʒæ*)⁸ are not planted close to houses, since it is believed that this brings misfortune (Miller and Frejman 1927-1934:II.1226).

4.1.1.8. The economic significance of oaks to the ancient Indo-Europeans. The Indo-European term for 'acorn'

The oak, which is linked to a whole complex of important mythological and

6. A term for 'oak' is also reconstructed for Proto-Semitic: **all-(ān-)*, Fronzaroli 1968:V.277.

7. There is an interesting description of the high mountain landscape of Nuristan (in eastern Afghanistan, inhabited by the Kafirs, speakers of the Nuristani branch of Indo-Iranian) by N. I. Vavilov, who traveled in the area: "The oak dies a natural death here from thunderstorms; along the road one sees huge stumps and burned trunks... oaks here grow to giants of ten meters and attain an average size of seven to eight meters" (Vavilov 1959-1965:I.130). The same passage mentions an oak-forested mountain pass *Parun*, clearly an Indo-Iranian variant of the Indo-European word for mountain oak forests (cf. *Pārun*, the Kafir name for the war god).

8. The etymologically unclear Ossetic word *tūlʒ* 'oak' is a replacement for the original term, which was subject to taboo in view of the beliefs associated with it.

ritual conceptions, must have played an essential role in the ancient Indo-European economy. First of all, it provided particularly strong material for construction and for crafting tools and other objects (as is discussed in more detail below). It was evidently the neuter (ancient inactive) noun ***t'oru-** that originally denoted oak wood,⁹ while the tree itself was designated by the non-neuter (ancient active) noun ***pher(kho)u-s**.

In addition to the use of oak wood, oak forests must have had special economic significance to the Indo-Europeans in the development of pig-breeding. Swineherds must have tended pigs in oak forests which were rich in acorns. The term ***k'oelH-** 'acorn', judging from its dialect distribution (Armenian-Greek, Italic, Balto-Slavic), is reconstructible for Proto-Indo-European: Arm. *kaṭin*, gen. *kaṭnoy* 'acorn', the source of *kaṭni* 'oak' (see Tumanjan 1978:198); Gk. *bálanos* 'acorn' (depicted in Homer as food for pigs, which were herded in oak-forested mountainous areas);¹⁰ Lat. *glāns*, gen. *glandis* 'acorn' (with a subsequent spread to stone fruits, chestnuts, dates, etc.),¹¹ Lith. *gylė* 'acorn', *gilėndra* 'rich harvest of fruits', Latv. *zīle* 'acorn', OPruss. *gile* 'acorn, oak', Russ. *želud'*, Pol. *żołędź* 'acorn'.

4.1.1.9. Taboo replacements for 'oak' in various Indo-European dialects

The term for 'oak', with its broad mythological connotations, frequently undergoes taboo replacement by terms of unclear etymology (cf. above on the Baltic, Slavic, and Ossetic terms for 'oak') or phonetic alterations.¹² One of the oldest

9. Cf. names for objects and tools formed from ***t'e/orw-**: Skt. *druvāya-* 'wooden dish', *druṇam* 'sword', *druṇī* 'bucket', *dru-ghnī* 'wooden mallet'; Avest. *dāuru-* 'wooden weapon; club'; Arm. *targal* 'spoon', Gk. *dōru* 'shaft, spear', *droitē* 'trough'; Mlr. *drochta* 'barrel, cask', *drochat* 'bridge'; OE *trig* (Engl. *tray*), OHG *trog* (Ger. *Trog*), OE *trog*, *troh* (Engl. *trough*), OHG *truha* 'chest, coffer' (Ger. *Truhe*); and others.

10. Cf. in the *Odyssey* (13.407-10):

δῆεις τόνγε σύεσσι παρήμενον. αἱ δὲ νέμονται
πάρ Κόρακος πέτρῃ ἐπὶ τε κρήνῃ Ἀρεθούσῃ,
ἔσθουσιν βάλανον μενοεικέα καὶ μέλαν ὕδωρ
πίνουσιν, τὰ θ' ὕεσσι τρέφει τεθαλυῖαν ἀλοιφήν
'He will be found near Raven's Rock and the well
of Arethousa, where the swine are pastured,
rooting for acorns to their hearts' content,
drinking the still, dark water.'

11. The semantic shift from 'acorn' to 'date', 'stone fruit' is also illustrated by the development of Skt. *parkaṭī* 'fig tree' from original PIE 'oak'. The change in the Indo-Aryans' ecological environment led to a loss of the terms for 'pig' and 'swineherding' as well as to a shift of the term for 'oak' to denote a sacred tree yielding economically valuable fruit — in ancient India, precisely the role of the fig tree.

12. Examples of these phonetic transformations of the original term for 'oak' are the Indo-Aryan terms for 'oak' and related concepts, as in the voicing of the reflex of ***kʰo** in Skt. *Parjanya-* and *pārijāta-* 'tree of paradise (*Quercētum*)', Panjabi *pargāi* 'oak sp.' In addition to this

such taboo replacements is the stem ***aik'**- 'oak', found primarily in Germanic: OIcel. *eik* 'oak', 'ship' (in poetic language), OE *āc* 'oak; oak ship' (Engl. *oak*), OHG *eih* (Ger. *Eiche* 'oak').¹³ A Greek cognate permits us to reconstruct this stem for 'oak, mountain oak' as a fairly early dialect replacement for the original term: Gk. *aigilōps* 'oak sp.' (*Quercus aigilops*, an eastern Mediterranean oak with edible acorns), an ancient compound whose second element is evidently cognate to Gk. *lōpē*, *lopós* 'bark'; cf. Lat. *aesculus* 'mountain oak' (from a derivative in *-sclos*? — Pokorny 1959:13) beside *quercus*, preserved as the generic term for 'oak'. Note that Greek replaces the original Indo-European term 'oak' with ***t'(o)ru-** (originally 'oak wood'), turning it into a non-neuter noun *drūs* 'oak', while ***aik'**- designated a particular (local?) species of oak.¹⁴ Only the taboo deformation *keraunós* 'thunderbolt, lightning (sent by Zeus)' preserves a trace of the ancient Indo-European ***pherkhou-**.

4.1.2. Birch

4.1.2.1. Proto-Indo-European 'birch'

A term for 'birch' (*Betula* L.) can be reconstructed for Proto-Indo-European, based on its dialect distribution, as ***bherHk̑-**. It is shared by such dialects as Indo-Aryan, Italic, and Baltic-Slavic-Germanic: Skt. *bhūrjā-* 'birch sp.', whose bark was used to make writing material (attested in the Yajurveda); in the Dardic languages of mountainous northwestern India we have Phalura *brhuḷ*, Dameli *brūš*, Gawar-Bati *bluz* 'birch' (Mayrhofer 1963:II.514-15); Waigali *brūj* 'birch' (Morgenstierne 1954:238), Khotanese Saka *bramja* 'birch', *brumja-* 'birchbark', Wakhi (Pamir Iranian) *furz*, Sanglechī *barež*, Shugni *bəruj* 'birch',

form, Panjabi has several terms for oak species, including the mountain oak, *Quercus ilex*: *kars*, *karś*, *karšu*, cognate to OPruss. *karige* 'mountain ash, rowan' and Germanic ***karkús** 'grove; priest, idol; pile of stones': OE *hearg* 'idol', OHG *haru(g)-*, OIcel. *hargr* 'pile of stones', 'sacrificial place' (P. Friedrich 1970:150, Ivanov and Toporov 1974:32; Toporov 1975:III.228-31).

Kartvelian ***k'rk'o-** 'acorn' may also come from this Indo-European form with ***k-**: Geo. *rko*, Tush dial. *k'urko*, Pshav dial. *girko*; Mingr. *k'a*, *k'i*; Geo. *k'urka* 'stone, pit of fruit' also obviously belongs here. Cf. also forms such as Italic ***k'werkus**: Lat. *quercus*, Venet. *Quarquēni*, and the Illyrian name for Corfu, *Kórkura*, *Kérkura* (cf. Shanidze 1947). Another taboo deformation may be Gk. *keraunós* 'thunderbolt, lightning sent by Zeus' (from ***per(k)auenos?**).

13. It is noteworthy that the ancient term for oak is often transferred to 'pine' in Germanic; see above. Cf., on the other hand, ONorse *dennia* 'fir, spruce', OHG *tanna* id., attested in the eleventh century with the meaning 'oak' as well (Germanic ***danwō**), cognate to Skt. *dhanvana-* 'fruit tree sp.', cf. Pokorny 1959:234.

14. According to Hirt (1968:20), Hom. Gk. *aiganéē* 'javelin, dart' and *aigís* 'aegis; shield of Zeus' (which evoked terror and with which he sent thunder and terror to people) also derive from the same root; hence *aigís* was originally 'the oak shield of the oak god' (*Eichenschild des Eichengottes*) who sent lightning.

Oss. *bærz/bærzæ* 'birch', Pashto *barj* 'birchbark band'; Tajik *burz, burs* 'juniper' (with semantic transfer).

OIcel. *björk* 'birch', OHG *birihha* (Ger. *Birke*), OE *beorc, birce* (Engl. *birch*). OPruss. *berse* 'birch', Lith. *béržas* id., *biržtva* 'birch forest', Latv. *bērzs, bērze* 'birch', Russ. *bereza*, Serbo-Cr. *brěza*, OCzech *břieza* 'birch', Russ. *beresta* 'birchbark', ORuss. *beresto* id., dial. *beresto* 'birchbark; letter, paper' (Filin 1965-II.257), Czech *břesta* 'birchbark', Pol. *brzesta* 'elm bark' (an old stem in **-th-*).¹⁵ Lat. *fraxinus* 'ash', *farnus* id. (with semantic shift). Thrac. *Berzovia*, place name in southwestern Dacia, interpreted as 'birch (creek)'.¹⁶

4.1.2.2. Proto-Indo-European 'birch' from 'bright'

The Proto-Indo-European nature of the term for 'birch' is confirmed by its connection with the stem **bherHk̑-* 'shine, be bright': Skt. *bhrājate* 'shines', Avest. *brāzaiti* id., Goth. *baírhts* 'bright, light', OE *beorht* (Engl. *bright*). The connection is based on the bright whiteness of birchbark.

4.1.2.3. Economic and ritual functions of the birch among the ancient Indo-Europeans

The primary economic value of the birch lies in its use in ancient times (continuing sometimes to the present) as material for making items ranging from shoes, dishes, and baskets to writing material, the latter especially among the Eastern Slavs and in India prior to the sixteenth century A.D.¹⁷

In addition, the shining whiteness of birchbark gave rise to the ancient status of the birch as a symbol of purity and innocence. Baltic folklore preserves fixed phrases where the word 'birch' has the meaning 'purity, innocence': e.g. Latv. *brūte vėl bērza galā* (var. *bērzgalā*) 'bridegroom and top of birch tree' (of maidens and young men) (Mühlenbach and Endzelin 1923-1932:I.292). Similar motifs appear in Germanic folklore (P. Friedrich 1970:157-58). These facts lend particular significance to Hitt. *parku-* 'ritually pure; innocent', derived

15. The same semantic shift is attested in the early Slavic forms of **berstū*: Russ. *berest* 'elm', Serbo-Cr. *bresten* 'elm' (adj.) in 11th-century texts, etc. The transfer is explained by the similarity of birchbark to elm bark, such that elm bark could be referred to by the term formerly referring to birchbark (Trubačev 1974-I.199).

16. Although the term for 'birch' is Proto-Indo-European in view of its distribution, it has been lost or its meaning changed in some dialects. Indirect evidence for this is provided by Basque (*bjurki* 'birch' (Tovar 1970:269), evidently a loan from some Indo-European dialect which still preserved the voicelessness of **k̑*).

17. Note that the Germanic rune *b* was called 'birch': OIcel. *björkan*, OE *beorc*, Goth. *bērcna* (**baírknā*): Grienberger 1896:185ff.

from the term for birch.¹⁸ The Hittite form goes back to a PIE **-u-* stem: **bh(e)rHk'-u-*,¹⁹ attested in Balto-Slavic (Slavic **berzovŭ-*: ORuss. *berezovij*, Barxudarov 1975-:I.145); Serbo-Cr. *brězov*, going back to the 14th century; Bulg. *brjazov*; Slav. **berz-u-jŭ* in the Russian toponym *Berezuj*, Trubačev 1974-:I.206-7; cf. Hitt. *parku-i-* 'clean, pure', Lith. *Béržuvis*, Toporov 1975-:I.213) and Thracian *Berzovia* (see 4.1.2.1 above). Both the morphological structure of the Hittite *-u-* form and its meaning point to formation from PIE 'birch' in the metaphorical meaning 'ritual purity, virginity'. This set of Hittite words has lost the original meaning 'birch' and preserved only the secondary meaning.

4.1.2.4. *The range of birch species*

Members of the birch family (*Betulaceae*) presently range throughout the moderate and northern zone of Eurasia, as well as in mountain regions of more southerly zones, where they grow to an altitude of about 1500 meters in the Caucasus, the Himalayas, and mountainous regions of southern Europe. In the Subboreal period (ca. 3300-400 B.C.) the birch was also found farther to the south (Xotinskij 1977, Gerasimova and Veličko 1982:121-23). The presence of a term for 'birch' in Proto-Indo-European shows that the Proto-Indo-Europeans knew this tree, which could have been the case either in a relatively moderate climate zone (in Europe, at a latitude reaching from northern Spain to the northern Balkans and eastward to the lower Volga) or in the mountainous regions of Asia Minor.

4.1.3. *Beech*

4.1.3.1. *Proto-Indo-European 'beech'*

The Indo-European term for 'beech', reconstructed as **bhaHk'o-*, undergoes semantic changes in some daughter languages, which complicates reconstruction of the original meaning: Lat. *fāgus* (fem.) 'beech' (cf. Gaul. *bāgos* in the toponym *Bāgācon*); OHG *buohha* 'beech' (Ger. *Buche*), OIcel. *bók* (fem.) 'beech', OE *bōc* 'beech' (cf. Caesar: *esse silvam ibi infinitae magnitudinis, quae*

18. This base gives the Hittite adjective in *-i parkui-* 'pure; innocent', nom. *parkuiš*, gen. *parkuwayaš*; the denominative verb root *parkueš-* 'clear oneself; prove innocent'; and the abstract noun *parkueššar*, gen. *parkuešnaš* 'purification'.

19. The comparison of Hitt. *parkui-* with Goth. *baírhts* and its cognates was made by Sturtevant (1933:§115), cf. Pokorny 1959:140.

appelatur Bacēnis 'there is a forest there of infinite extent, called Bacenis' — *De bello Gallico* 6.10). Gk. *phēgós*, Dor. *phāgós* (fem.) 'oak' also belong to this set.²⁰

A number of forms belonging to this same group show possible traces of *-u* after the root vowel, perhaps connected with a laryngeal: OIcel. *beyki* 'beech forest', OE *bēce* (Engl. *beech*) (if they are not from **bōkjo-*: Watkins 1971:1508; cf. Lane 1967:202-5).

Slavic **bukǔ* (ORuss. *buk*", Russ. *buk*) 'beech', in view of its voiceless reflex of PIE **k'*, is considered a loan, probably from Germanic **bōk-* (Trubačev 1974-:III.90-91, with references); for the same reason the Baltic forms Lith. *bùkas*, OPruss. *bucus* 'beech' must be borrowings, though the source is not entirely clear (Toporov 1975-:I.262-63).²¹

4.1.3.2. *The ritual function of the beech in ancient Indo-European traditions*

In ancient Indo-European traditions the beech is a sacred tree, connected with major deities such as the Roman Jupiter and Diana. The special sacral significance of the beech in Germanic culture has to do with the use of beech wood and beech bark as the material and means for writing, as is reflected in the meanings of the reflexes (Feist 1939:102): Goth. *bōka* 'letter of alphabet', pl. *bōkōs* 'writing, written document, book', *bōkareis* 'scribe, literate person', OIcel. *bók*, OE *bōc* (Engl. *book*), OHG *buoh* (Ger. *Buch*) 'written document, book', *buohstap* (Ger. *Buchstabe*) 'letter of alphabet' (from 'beech stick for

20. Cf. Homer on the oak of Zeus: *hup' aigiókhōio Diòs perikallēi phēgōi* (Iliad 5.693) 'under the miraculous oak of ægis-bearing Zeus'; and on the oak where Pallas Athena and Apollo, the son of Zeus, meet: *allēloisi dē tō ge sunantēsthēn parà phēgōi* (Iliad 7.22) 'These two then encountered each other beside the oak tree'. Judging from Homer's use of *phēgós*, its meaning 'oak' in Greek must be a replacement of the original Indo-European meaning 'beech' by 'sacred tree; tree of the Thunder-hurler', whose name is not preserved in Greek (but cf. Gk. *keraunós* 'lightning', discussed above).

21. The speakers of Balto-Slavic, who during historical times have lived in the beech zone, have lost the inherited term for 'beech' and borrowed it from another branch. It is not impossible, however, that the Balto-Slavic term may be the inherited one, with anomalous preservation of voicelessness in the reflex of **k'*. Such relics are preserved in a few isolated terms, e.g. Skt. *tarū-* 'tree' beside regular *dāru* (PIE **t'oru-*).

Another solution is to assume a semantic shift in the inherited term, possibly to 'elder' (Russ. *buzina*), and consequent borrowing of the term for beech. If this is the source of Russ. *buzina*, then the Indo-European protoform must be reconstructed with palatovelar **k̑*: Slavic **büzü* (OCz. *bez* 'elder', Polab. *bāz* 'elder, lilac', ORuss. *boz*" 'elder', Barxudarov 1975-:I.274), **büzina* (OUkr. *bzina*), **buzina* (Russ. *buzina*, Slovincian *bēsānd* 'elder'). However, this etymology is objectionable due to the root *u* vocalism and the semantics: cf. Trubačev 1974-:III.104, 143-46. Formally, Alb. *bungë* 'oak' (Hamp *apud* P. Friedrich 1970:108) and Kurdish *būz* 'elm' may belong here; but cf. Eilers and Mayrhofer 1962, where the Kurdish word is traced to **vīz* 'elm'.

writing').²² The Germanic words were borrowed into Slavic with these meanings: OCS *bukŭ* 'letter of alphabet', *bukarĭ* 'literate person' (cf. Goth. *bōkareis*); Polab. *būkvoi* 'books', ORuss. *buky*, *buk*"v' 'letter of alphabet', pl. 'writing, letter, epistle' (Barxudarov 1975-:I.352).²³

4.1.3.3. *The range of the beech and the 'beech argument' for the Indo-European homeland*

In historical times the eastern limit of the beech (*Fagus silvatica* L.) has held closely to a line running from the Baltic Sea approximately along the Vistula River southward to the middle Danube. In fact this distribution has given rise to one of the basic arguments advanced by proponents of a European homeland for Proto-Indo-European (see Wissmann 1952, Krogmann 1954, 1955, Lane 1967 and references therein). However, recent paleobotanical research has shown that there was a westward and northward displacement of the limits of the beech range to their historical locations in Europe, and this occurred no earlier than the Subboreal period (late fourth to first millennia B.C.): Nejřtadt 1957:305-11. In addition, varieties of the eastern beech, *Fagus orientalis*, have always been found in the Near East, from Asia Minor to the Transcaucasus and northern Iran.²⁴ Hence, if the beech argument is to be used in locating the Indo-European homeland, it gives us a choice between a western European area (including the western parts of eastern Europe) and a Near Eastern area running from Asia Minor to northern Iran; but it rules out the area northeast of the Black Sea to the lower Volga, where the beech is unattested throughout the post-glacial period.

4.1.4. *Hornbeam*

4.1.4.1. *Proto-Indo-European 'hornbeam'*

The term for 'hornbeam', ***(s)k'rōbhō-**, shows a dialect distribution similar to

22. There is an analogous use of birchbark for writing in Slavic and Indic cultures, mentioned 4.1.2.3 above. The Germanic word OHG *stap* 'stick, staff', OIcel. *stafr* id. also means 'runic letters, writing': Runic *stAba* 'runic stick; rune' (Makaev 1965:138), OE *stæf* 'letter', pl. 'writing, literature'.

23. The Common Slavic (or at least early Slavic) nature of the Germanic loans raises the question of whether Slavs did not perhaps have writing prior to the creation of the Glagolitic alphabet by Cyril and Methodius in the ninth century. The mention by the monk Xrabr of 'marks and cuts' by which the Slavs 'read and prophesied' (cf. Jakubinskij 1953:71-76) is interesting in this connection.

24. Proto-Kartvelian has a word for 'beech', **c'ip-*: Geo. *c'ipela*, Mingr. *c'ipur-*, Laz *c'ip(u)r-*, Svan *c'ip-ra*: Gamkrelidze and Mačavariani 1965:76.

that of the beech term: Russ. *grab*, *grabina*, Czech *habr*, *hrabr*, Pol. *grab* ‘hornbeam’, Polab. *gróbē* ‘hornbeam grove’, Serbo-Cr. *grāb*, *grābar*; OPruss. *wosi-grabis* ‘spindle tree, *Euonymus*’ (lit. ‘goat hornbeam’: Būga 1958-1961:II.104); Latv. *Gruōbiņa* (toponym from **gruōbas*), Lith. *Gruobýnas*, dial. *Grōubýnc* (toponym: Būga 1958-1961:III.736). Umbr. *Grabouio-*, epithet for three Umbrian gods (Dumézil 1966:155, with references). Several forms show initial **s-*: Lith. *skrōblas* ‘hornbeam; beech sp.’, Latv. *skābarde* ‘hornbeam’, Alb. *shkozë* ‘hornbeam, beech’; cf. Lat. *carpinus* ‘hornbeam’, with anomalous correspondences.

Various species of hornbeam (*Carpinus* L.) grow in western and eastern Europe (*Carpinus betulus* L.), as well as in mountainous regions of the Near East and Caucasus (*Carpinus orientalis*, *Carpinus caucasica*, *Carpinus schuschaensis*), where the hornbeam has grown since the Boreal period (Nejstadt 1957:269).²⁵

4.1.4.2. The origin of the Indo-European term for ‘hornbeam’

The term for ‘hornbeam’, like that for ‘beech’, is etymologically connected with verbal forms meaning ‘scratch’, ‘make marks’, later ‘write’, which shows that this term was used in ancient times for making graphic signs. The term *(s)k’rōbh- ‘hornbeam’ itself is clearly derived from *(s)k’rebh- ‘scratch, scrape, draw’: Gk. *gráphō* ‘scratch, write’²⁶ (from *k’r̥bh-), *grámma* ‘letter of alphabet’, OHG *kerban* ‘make notches’ (Ger. *kerben*), OCS *žrěbǫjǫ* ‘die, dice’, OPruss. *gīrbīn* ‘number’ (from ‘number of notches’), OE *screpan* (Engl. *scrape*), Russ. *skrebu* ‘scrape, scratch’.

4.1.4.3. Tree names connected with terms for making marks on wood

The etymological connection of the names for birch, beech, and hornbeam with the terminology for writing shows that the earliest Indo-European cultures had writing technology and prepared materials for writing. The rise of writing in these cultures was based on the use of special wooden sticks for marking or

25. Hence the existence of a Proto-Kartvelian word for ‘hornbeam’, **krcxeml-*: OGeo. *krcxeml-* (Geo. *rcxila*), Mingr. *cxemur-*, *cximur-*; Laz *cxemur-*, *mcxubr-*, Svan *cxəm*, *cxum*, *cxwim* (Klimov 1964:200). Comparison of OGeo. *krcxeml-* with the West Kartvelian (Mingrelian-Laz and Svan) forms suggests a compound form **gr-cxeml-*, with an initial element **gr-* (with assimilative devoicing in Georgian) absent in West Kartvelian.

26. In Homer the term still has both meanings: ‘scratch’ (*grápsen dé hoi ostéon ákhreis aikhmē Pouludámantos*, Iliad 17.599-600 ‘but the spear of Polydamas had grated the bone’s edge’) and ‘mark, write’ (*grápsas en pínaki piuktōi*, Iliad 6.169 ‘which he inscribed on a folding [wooden] tablet’).

incising wood or wooden material. This technology is associated with the oldest Indo-European cultures and evidently reflects a more archaic typological stage in the evolution of writing than carving signs in stone, pressing them into clay tablets, or writing them on specially prepared hides. (Relevant in this connection are the documents written on wood — GIŠ.ĤUR — in ancient Anatolia; this is discussed in more detail below.)

4.1.5. Ash

4.1.5.1. Indo-European 'ash'

Based on its dialect distribution, a term ***Hos-** 'ash', with possible suffixal derivatives in ***-kh-**, ***-i-**, and ***-n-**, evidently of heteroclitic origin, can be reconstructed for an ancient Indo-European stage: it is attested in Greek-Armenian, Balto-Slavic, Albanian, Germanic, and Italic-Celtic. The word has been lost in the remaining dialects. Cognates: Arm. *hac'i* 'ash'; Gk. *oksúē* 'beech; spear shaft' (with semantic transfer); Alb. *ah* 'beech'; ORuss. *jas'n* 'ash', Russ. *jasen'*, Pol. *jasień*, Polab. *josén* 'ash', Serbo-Cr. *jāsén*; Lith. *úosis*, Latv. *uôsis*, OPruss. *woasis* 'ash'; OIcel. *askr* 'ash, spear, vessel', OE *æsc* (Engl. *ash*), OHG *asc* (Ger. *Esche*) 'ash'; Lat. *ornus* 'mountain ash', OIr. (*h*)*uinnius*, OCom. *onn-en*, Bret. *ounn-enn* 'ash'; cf. Ligur. *Oskéla* 'ash forest' (Pokorný 1959:782).²⁷

4.1.5.2. The range of the ash

Species of ash (*Fraxinus* L.) are found throughout the Mediterranean area. It ranges southward to North Africa and eastward to Asia Minor, northern Mesopotamia, the Caucasus, the Caspian steppes (*Fraxinus oxycarpa*), and the northern Black Sea coast (from Asia Minor to the Iberian peninsula, *Fraxinus ornus*). In the more northerly parts of Europe, the mountain ash (*Sorbus aucuparia* L.) has coexisted with *Fraxinus ornus* since antiquity.

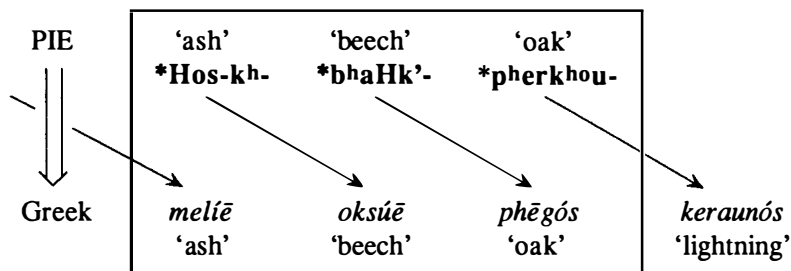
4.1.5.3. Semantic shifts among Indo-European tree names

The semantic shift from 'ash' to 'beech' in Greek (and possibly in Albanian) is part of a larger system of shifts within the semantic field of tree names, obviously motivated by ecological and cultural conditions. Gk. *phēgós*, cognate to

27. Also interesting is Cheremis *oško* 'ash', borrowed from an Indo-European dialect (early Baltic?) where the form had the ***-kh-** suffix.

Indo-European ‘beech’, shifted to ‘oak’ on Greek soil, while the meaning ‘beech’ came to be expressed by the ancient term for ‘ash’, *oksúē*. The semanteme ‘ash’, thereby deprived of formal expression, acquired as its label the Greek neologism *melīē*, frequent as early as Homer in the meaning ‘ash; ash spear shaft’. We thus have a systematic chain of semantic shifts wherein a change in one term triggers changes throughout the series and causes a formal transformation in the semantic relations within the field. This is shown in Figure 3.

Figure 3



4.1.6. *Aspen, poplar*

4.1.6.1. *Terms for ‘aspen, poplar’ in the Indo-European dialects*

Despite the extreme dialect restriction of terms for ‘aspen’ and ‘poplar’, which are limited to Baltic-Slavic-Germanic (Stang 1972:13), we can be fairly certain of a stem ***(H)osph-**, reconstructible for a considerably older stage on the evidence of loans into Central Asian languages and possible reflexes in Sanskrit and Greek. Balto-Slavic forms: OPruss. *abse* ‘aspen’, Latv. *apse*, Lith. *āpušė*, *ēpušė* ‘aspen’, ORuss., Russ. *osina* ‘aspen’, LSorb. *wosa*, *wósa* ‘silver poplar’, Bulg. dial. *jasika* ‘aspen, birch, poplar sp.’.²⁸ Germanic: OIcel. *qsp* ‘aspen’, OE *æspe* ‘aspen’, OHG *aspa* (Ger. *Espe*). Probably also related are Skt. *sphyá-* ‘piece of wood; wooden tool, oar, shovel’ (Janert 1964) and Pers. *fiḥ* ‘oar’, Wakhi *pēi* ‘shoulder blade, shoulder’ (see Mayrhofer 1976:III.547). The same Indo-European root is claimed for Hom. Gk. *aspís* ‘shield’ (beside *áspris* ‘oak sp.’); see note 14 above on Gk. *aigís* ‘shield of Zeus’ from ‘oak’ (P. Friedrich

28. Some of the South Slavic forms with suffixed *-ika* have the meaning ‘black poplar’. The Slavic name for this tree, **asokor-ŭl-ŭ* (Russ. *osokor’*), can be interpreted as a compound **aso-kor-* ‘aspen-barked’ (cf. Slavic *kor-* ‘bark’); cf. Gk. gloss *áskra · drūs ákarpos* ‘oak sp.’ and the possible Basque loan *azkáf* ‘oak sp.’ (Trubačev 1974:I.82).

1970:50), also Gk. gloss *áskra* ‘oak sp.’ (see note 28). The initial *a-* in the Greek forms may reflect a laryngeal.

4.1.6.2. Indo-European words for ‘aspen, poplar’ in Turkic languages

Loans from Indo-European dialects into Turkic languages are particularly significant for establishing the age of the Indo-European term for ‘aspen, poplar’, since they show that the term was once more widely distributed and occurred in some eastern dialect: Altai *apsaq* ‘poplar’, dial. *aspaq* id., Tobol’sk *awsaq* ‘poplar’, Chuvash *ăvăs* ‘aspen’. The Turkic forms point to an Iranian or Iranian-like source (Hoops 1905:122-24).

4.1.6.3. The range of the aspen

The aspen (*Populus tremula* L.) is found throughout Eurasia from eastern Europe to western Siberia, and also in the Mediterranean area,²⁹ including North Africa. The poplar (*Populus nigra* L., *Populus alba*, *Populus canescens*) is found in the more southerly regions of Europe and in the Near East. Since within every Indo-European dialect the meaning of **(H)osp^h-* fluctuates between ‘aspen’ and ‘poplar’, it is impossible to restrict the reconstructed form to one or the other of the two meanings. The species are similar enough that a single term could have referred to both of them, with subsequent differentiations only in the daughter languages.³⁰

The phonetic similarity of PIE **Hos-* ‘ash’ and **(H)osp^h-* ‘aspen, poplar’ is striking; the two terms may ultimately descend from a common root **Hos-*.

4.1.7. Willow

4.1.7.1. Indo-European ‘willow’ and its later replacements

A term for ‘willow’ (*Salix* L.) is preserved in Italic-Celtic, Germanic, and Greek, and can, on the evidence of its dialect distribution, be reconstructed for Proto-Indo-European in the archaic form **šo(e)lik^h-*, with an initial labialized sibilant (see I.2.4.3 above): Lat. *salix* ‘willow’, OIr. *sail*, gen. *sa(i)lech*, Welsh

29. Cf. Proto-Kartvelian **werxw-* ‘aspen’: Geo. *werxw-*, Ming. *verxv-*, *vex-*, Svan *jerxw*, *werxw*, Klimov 1964:84.

30. New terms specifically meaning ‘poplar’ arise only later and independently in the various dialects: e.g. Lat. *pōpulus* ‘poplar’ (cf. Russ. *topol’*: Vasmer 1958:III.121 [1964-1973:IV.79]), Slav. **agnedŭ* ‘black poplar’, etc.

helyg-en ‘willow’, Gaul. *Salicilla* (personal name); OHG *sal(a)ha*, MHG *salhe* (Ger. *Salweide*), OE *sealh*, OIcel. *selja* ‘willow’. MHG *wilge* ‘willow’, OE *welig* (Engl. *willow*); Gk. *helikē* ‘willow’, *Helikōn* ‘Mount Helicon’, lit. ‘willow mountain’, from *welikōn* (Frisk 1954:I.494; Chantraine 1968:I.338).

The consistency of the meaning ‘willow’ in the ancient dialects and the archaic nature of the reconstructed form with its labialized sibilant allow us to consider the word a Proto-Indo-European formation, preserved only in a few dialects and replaced by other formations elsewhere. In dialects not preserving the original term it has been replaced by descriptive formations like ‘tree with branches for weaving’:³¹ Avest. *vaēiti-* ‘willow; willow withes’, cf. Skt. *vetasāh* ‘canes, rushes, reeds, withes’; Lith. *vytis* ‘willow withes’, Latv. *vītuōls* ‘willow’, OPruss. *witwan* ‘willow’, Russ. *vetla* ‘willow’, all from PIE **wei-* ‘weave’ with **-th-* extension. Even in dialects preserving the original term **śo(e)likh-*, competing new formations sometimes arise from the verb ‘weave’: Gk. *uēa* ‘willow’ (in Homer also ‘vine’, lit. ‘woven’, cf. Lat. *uītis* ‘vine’ from the same root), Aeol. *witus* ‘willow’, OIcel. *víðir* ‘willow’, OE *wīðig* ‘willow’, OHG *wīda* ‘willow’ (Ger. *Weide*, cf. also *Salweide* ‘willow’ with both stems).

Species of willow (*Salix pendula*, *Salix alba*, *Salix vitellina*) are found throughout Eurasia, including the Himalayas, the Near East, and the Caucasus (*Salix babylonica*).³²

4.1.8. Yew

4.1.8.1. Proto-Indo-European ‘yew’

An Indo-European name for the yew (*Taxus*), an evergreen tree or bush that lives to a great age (up to 3,000 years), is reconstructed as **ei-/*oi-* (with ablaut), extended by suffixes **-wo-*, **-kʰo-*, or **-o-* on the evidence of a number of Indo-European dialects. In some dialects the inherited form is preserved but its meaning undergoes a shift. Forms with unchanged meaning:

OIr. *eo* ‘yew’, Welsh *ywen*, OCom. *hiuin*, Bret. *ivin*, Gaul. *ivo-* ‘yew’ (Pokorny 1959:297).

OHG *īwa* (Ger. *Eibe*) ‘yew’, OE *īw*, *ēow* (Engl. *yew*), OIcel. *yr* ‘yew’; in

31. Willow branches and withes were widely used for weaving baskets and other objects and ornaments. Interesting in this connection is Homeric *wélikes* ‘woven fastenings used to hold garments on the chest’, derived from the term for ‘willow’.

32. There are ancient terms for willow in Proto-Semitic, **hīlāp-* (Fronzaroli 1968:V.278), and in Proto-Kartvelian: **ʒečʰn-*, Geo. *zecʰna-*, Ming. *zičʰon-*, Svan *čičʰ-ānd-*. The Proto-Kartvelian stem can be analyzed as a compound **ʒel-čʰn-* ‘tree + weave’ (Čikobava 1942:33), which repeats the semantic structure of the Indo-European names for willow as ‘tree with branches for weaving’. The same connection with weaving is preserved if we instead interpret the Proto-Kartvelian form **ʒečʰn-* (or **ʒečʰn-ʔ*, cf. Ming. *zičʰon-*) as a reduplication of **čʰan-/čʰn-* ‘weave, plait’ (for Kartvelian reduplicated stems see I.4.3.3 above).

Germanic we also find parallel forms in **-k^ho-*: OHG *īga*, OE *īh*, *ēoh* 'yew' (and also the name 'eoh' of the Runic letter for [e]).

OPruss. *iuwis* 'yew'; OCz. *jíva* 'yew; willow'.

With semantic shift to other tree species (apparently based on sharing of one or another physical property):

Russ. *iva* 'willow' (cf. OCz. *jíva* 'yew' and 'willow', mentioned above), Serbo-Cr. *īva* 'willow'; Lith. *ievà*, Latv. *iēva* 'bird cherry'; Lat. *ūua* 'bunch of grapes', Gk. *oīē*, *óē*, *óa* 'mountain ash' (**oiwa*); Arm. *aygi* 'grapevine' (**oiwiā*), cf. Pokorny 1959:297.

In several dialects where the word has undergone semantic shifting, the yew is referred to with other, possibly related, terms: Lat. *taxus* 'yew', Russ. *tis*.³³

4.1.8.2. *The etymology of Hittite Gišeya-. The ritual and mythic role of the yew in individual Indo-European traditions*

Hittite *Gišeya-* (an *-o-* derivative: **eyo-*) 'sacred evergreen tree' also belongs among the derivatives of **ei-*. It shows that a group of words with the root **ei-*, referring to the evergreen yew tree, can be reconstructed with certainty to Proto-Indo-European.

In the Hittite tradition the evergreen tree *Gišeya-*, which evidently symbolized the Cosmic Tree, figures as a plant of inexhaustible vital force, one which never loses its leaves.³⁴ A formula wishing the king and queen long life is built on a comparison of their life to the ever-living and renewing tree *Gišeya-*:

Giše-ya-an ma-aḥ-ḥa-an uk-tu-u-ri i-ya-at-ni-ya-an nu ḥur-pa-aš-ta-nu-uš ar-ḥa Ū.UL iš-ḥu-wa-i LUGAL-ša SAL.LUGAL-ša QA.TAM.MA i-ya-at-ni-an-te-eš a-ša-an-du ud-da-a-ar-aš-ma-aš QA.TAM.MA uk-tu-u-ri e-eš-du

'Just as the tree *eya-* is eternally green and never throws its leaves away, so may the king and queen be green (prosperous, flourishing) and may their deeds also be everlasting' (KUB XXIX I 4 17ff.)

33. Cognates to Lat. *taxus* 'yew' have also been sought in Gk. *tókson* 'bow' (supposedly 'made of yew'), Skt. *takṣaka-*, tree name, Persian *taxš* 'bow'. For details see P. Friedrich 1970:126-29.

34. The ritual nature of the tree *Gišeya-* is clearly seen in the myth of Telepinus, where a tree appears as a symbol of the return of fertility and prosperity. The myth ends with the erection of a Cosmic Tree, *Gišeya-*, on which are hung sheep or goat hides (UDU-*aš kuršaš*); inside is placed ram's fat (UDU-*aš IÀ*), inside of that the 'grain of the god of the fields' and 'wine', inside of these a bull and a sheep (GUD UDU), and in them longevity and youth. According to §50 of the Hittite Laws, planting the tree *Gišeya-* at the gate (*aški*) of a house in the priestly city Arinna makes a person free (*arawan*) from taxes.

Similar ritual and mythological motifs are connected with the yew tree in other Indo-European traditions. In the Germanic tradition the 'evergreen yew' is a symbol of rebirth after death. In an early Scandinavian Runic poetic text from Norway, the yew (ýr) is celebrated as 'the greenest of the trees (*vetr grænstr*) during the winter'. As a symbol of eternal life and rebirth after death, yews (*ēoh*, *ēow*) were planted in cemeteries by the ancient Anglo-Saxons (Wrenn 1965, Page 1968). The similarity of these notions to the Hittite ones involving *Gišeya-* is obvious. In ancient Celtic tradition as well, the yew was revered as a sacred tree. This ritual and mythological role of the yew, reconstructible for ancient Indo-European and possibly even Proto-Indo-European tradition, is explained by its botanical properties, specifically its evergreen foliage and extremely long lifespan.

4.1.8.3. *The range of the yew in Eurasia*

In Europe the yew ranges from Scandinavia to the mouth of the Danube; its eastern boundary approximately coincides with that of the beech. The abundance of yews in Germany and Gaul in Caesar's time was noted in *De bello Gallico* 6.31: *taxo, cuius magna in Gallia Germanique copia est* 'the yew, of which there is great plenty in Gaul and Germany'. The yew has not been native to eastern Europe and the northern Mediterranean during historical times: Firbas 1949:270. A yew species, *Taxus baccata*, also occurs in a separate, more southerly range, in the Caucasus (southward from the North Caucasus, see Berg 1955:265), Asia Minor, and parts of the Balkan peninsula (P. Friedrich 1970:123). In the Indo-European dialects whose historical locations are in territories where the yew is not the typical evergreen plant, the inherited term for 'yew' is transferred to other trees and even bushes, based on physical similarity: Slavic **(j)iva* means 'willow' in most Slavic languages, Lith. *ievà* and Latv. *iēva* mean 'bird cherry (*Padus*)', and so on. Evidently connected with the transfer of inherited **ei-* to other plants are functional shifts away from the original Indo-European cultic significance of the evergreen tree. In some later traditions the position of the yew as symbol of eternal life and periodic renewal of vital force is taken over by other evergreen species. In late European traditions (recent historical Germanic and in part Slavic, cf. Bogatyrev 1971) this role is acquired by the fir (OHG *tanna*, Ger. *Tannenbaum*) or another conifer, in turn taken up by the Christian tradition where it appears in the form of the Christmas tree.

4.1.9. Fir, spruce, and pine

4.1.9.1. Dialect terms for conifers in Indo-European

Among the terms for evergreens, in addition to 'yew' there is a term fairly well represented among the Indo-European dialects (Nuristani, Greek, Ancient European), ***pheuḱh-/pḥuḱh-** 'fir, pine': Kafir: Waigali *puc* 'pine species', Kati *pūci* 'pine' (Morgenstierne 1954:162, 289); Gk. *peúkē* 'fir, pine' (already in Homer), Mlr. *ochtach* (fem.) 'fir; spear', OHG *fiuhta* 'fir' (Ger. *Fichte*), OSax. *fiuhtia* 'fir'; OPruss. *peuse* 'pine', Lith. *pušis* 'pine'.

Another, phonetically similar root meaning 'pine, fir' can be reconstructed as ***phith-**, with further suffixal derivatives: Gk. *pítus* 'pine' (possible also 'fir'), Pamirian *pit* 'fir' (cf. Wakhi *pit*, a species of tree, Grjunberg and Steblin-Kamenskij 1976:414), cf. Skt. *pītu-dāru*, a tree species; Lat. *pīnus* 'pine, fir, spruce' (from **pit-s-nu-s*), Alb. *pishë* 'fir' (from **pit-s-yā*). The dialect distribution of these words (Greco-Aryan, Italic, Albanian) confirms the Proto-Indo-European character of ***phith-** 'pine, fir'.

On semantic grounds, Gk. *píssa* 'pitch', Attic *pítta*, and Lat. *pix*, gen. *picis* 'pitch' (root ***phikh-**) can be placed in this group, a fact which allows us to regard ***phith-** 'pine, fir' and ***phikh-** 'pitch' as derivatives in ***-th-** and ***-kh-** respectively from a shared root ***phei-/pḥi-** (Pokorny 1959:794).

4.1.9.2. The origin of the Indo-European names for conifers and their etymological connection to 'pitch' and 'dye', 'paint'

Comparison of ***phi-th-** and ***phi-kh-** with ***pheuḱh-** allows us to further see the latter as a root ***pheu-** and a suffix in zero grade, ***-ḱh-**. The roots ***pheu-** and ***phei-** thus arrived at can then be seen as very close phonetic variants that referred to certain species of resinaceous conifers. There is a striking formal identity of ***phi-kh-** 'pine pitch' to the verbal root ***phikh-/pḥeikh-** (with variants in ***-k'-** and ***-ḱh-**) 'paint, color' (Pokorny 1959:794):

Skt. *piṅkte* 'paints', OPers. *ni-pišta-* 'written, drawn', Avest. *fra-pixšta-* 'painted', Gk. *poikílos* 'spotted'; Lat. *pingō*, *pinxi*, *pictum* 'paint, embroider' (*togam acu* 'embroider a garment with a needle'); Toch. A *pik-*, *peka-* 'draw, paint, write', B *piṅk-*, *paika-* 'write'; Oícel. *fā* 'paint, dye', *fā rúnar* 'carve runes', Lith. *piẽšti* 'draw, write', OPruss. *peisāi* '(they) write', OCS *pišq* '(I) write', etc. The presence of archaic forms with nasal infix (Skt. *piṅkte*, Toch. B *piṅk-*, Lat. *pingō*) allows us to segment the word into a root ***phei-/pḥi-** and a velar suffixal element.

The formal linkage of ***phi-kh-** 'pitch' and ***phei-kh-/pḥi-kh-** 'draw, paint' can be interpreted as an original identity of the words, apparently due to

the use of pitch in early technology as a dark vegetable dye³⁵ for making symbolic pictographic signs and drawings, and later for writing as well. It is this word that then becomes the Indo-European term for writing and painting.³⁶

4.1.9.3. The range of pines and firs in Eurasia

The foregoing makes clear the Proto-Indo-European status of the whole group of interconnected words for 'pine', 'fir', and 'pitch' (with replacement by new forms in some dialects).

The fir (*Abies* Mill.) in various species (*Abies alba*; *Abies Nordmanniana*) is attested since the middle and late Atlantic period (seventh to fourth millennia B.C.) in the Transcaucasus and the Near East, as well as in the lower Volga basin and the Pripet'-Desna basin in eastern Europe. Later the fir was succeeded by several other tree species, and it is now preserved primarily in mountainous areas of Europe, the Caucasus, the Near East, and eastern Europe (Berg 1955:269ff.).

Pines (*Pinus* L.) in various species (*Pinus mughus*; *Pinus hamata*) have been found since ancient times in mountainous regions of the Caucasus and Carpathians, as well as in the Black Sea area (Nejstadt 1957:248, Firbas 1949:140).

Due to the physical similarity of pine and fir, terms in Indo-European languages frequently alternate between the two meanings, the meaning in any given dialect depending on which of the two trees was predominant in the environment inhabited by speakers of that dialect. Therefore it is impossible to establish precisely which stem, ***pheuǵh-** or ***phith-**, originally designated firs and which pines. It is at least conceivable that Greek, where both terms are preserved with roughly complementary meanings — *peúkē* primarily 'fir' and *pítus* primarily 'pine' — may preserve the Proto-Indo-European distribution.

4.1.9.4. The Indo-European term for spruce

Also related to these conifers are the spruces (*Picea* L.), with several species (*Picea orientalis*, *Picea excelsa*, *Picea obovata*). In ancient times spruces were

35. Pitch and tar are characterized by their black color in e.g. Homeric *melánteron ēúte píssa* (Iliad 4.277) 'black(er) than pitch', Russian *černyj kak smol'* 'black as pitch', Engl. *pitch-black*, and similar archaic folkloric formulas.

36. The use of the Indo-European word for pitch or tar ***phikh-** to denote writing and painting (***pheikh-**/***phikh-** 'write; draw; dye') can be compared with the use of the ancient word for 'black, dark; black or dark (vegetable) dye' (Mann 1968:249) in various dialects in the meaning 'write; draw, paint': cf., on the one hand, Gk. *mélas* 'black', fem. *mélaina* (cf. *id mélana* 'ink'), Skt. *mlā-na-* 'black, dark', Latv. *mēlns* 'black', Alb. *mëllenjë* 'elm'; on the other, Goth. *mēljan* 'write, draw', *mēla* 'written mark, sign', OHG *mālōn* (Ger. *malen*) 'paint, draw', ONorw. *mæla* 'dye, paint'.

found only in high mountainous regions, in particular in the Caucasus and the mountainous regions of central and southern Europe.

An Indo-European term for 'spruce' can be reconstructed only for certain dialect areas. In Balto-Slavic we have OPruss. *addle* 'spruce', Lith. *ėglė*, Latv. *egle*; Pol. *jodła* 'spruce', dial. *jedlina* 'fir', OPol. *jedl(a)*, OCz. *jedla* 'spruce' (cf. *jedle* 'fir'), Russ. *el*'. Cognates in Italic-Celtic mean 'elder': Lat. *ebulus*, *ebulum*, Gaul. *odocos*. This set of words presupposes a protoform **edhlo-* whose original meaning is unclear: it may have referred to a conifer such as the spruce, or to a small deciduous plant such as the elder. The term may be cognate to a verbal root **edh-* (Lith. *adýti* 'dam', *ādata* 'needle'), a fact which would seem to decide in favor of a meaning 'conifer', 'spruce': **edhlo-* can thus be etymologized as 'sharp, prickly' (cf. Pokorny 1959:289-90).

In Greek the spruce is designated by *elátē* (< **el-ŋ-tā*), which also means 'oar' in Homer. Spruces 'reaching to the skies' (*ouranomēkēs* 'sky-high', Odyssey 5.239) were used for shipbuilding in Homeric Greece. The same meaning 'spruce' is found in the Armenian cognate *elevin* (**el-eu-*) 'spruce; cedar' (Ačarjan 1971:II.18). Russ. dial. *jalovec* 'juniper', Cz. *jalovec* are usually included with this set (but see Vasmer 1958:488 [1964-1973:IV.554]).

Thus we have two dialectally restricted terms for 'spruce': **edhlo-* and derivatives of **el-*.³⁷ A single, Proto-Indo-European, form meaning 'spruce' cannot be reconstructed.

4.1.9.5. Iranian terms for conifers and their Kartvelian parallels

Another dialect term for 'conifer' is proposed for Iranian on the evidence of OPers. *θarmiš haya naučaina* '(elm) tree of the cypress type', where **nauča-* can be reconstructed for Old Iranian with reflexes Pers. *nōj*, *nōž*, *nōz*, Pehl. **nōč* (borrowed into Armenian as *noč*, *noči* 'cypress'). In Iranian we also find parallel forms with another, phonetically similar, form: Pers. *nājū* 'pine', *nāžūn* 'juniper', *nažuvān* 'conifers', Oss. *næzy/naz* 'pine' (Abaev 1973:II.177-78). Forms close to the Iranian ones are found in the Kartvelian languages: Geo. *naɣw-* 'spruce',³⁸ Ming. *nuzu* ~ *nuzu*, Svan *le-nz* 'pine', *nezwra* 'pine, spruce', which presuppose a Proto-Kartvelian stem **naɣw-*.

37. The same root **el-* is sometimes also linked with other tree names in various dialects, in particular the Italic-Celtic-Germanic term for elm: Lat. *ulmus* 'elm' (**ol-mos* or **l-mos*, Pokorny 1959:303), Mlr. *lem* (**lemos*), OHG *ēlmboum* 'elm' (Ger. *Ulme*), OE *elm* (Engl. *elm*), Olcel. *almr*.

In addition to this root, the meaning 'elm' (*Ulmus* L.) is carried in other dialects by other words, common to Balto-Slavic, Germanic, Albanian, and also Iranian: Latv. *vīksna*, Lith. *vinšna*, ORuss. *vjaz*, Russ. *vjaz*, Alb. *vith*, Kurd. *viz* 'elm'; also OE *wice* (Engl. *wych-elm*), LGer. *wike* 'elm'. The source forms are **weik̑-*, **wink̑-* (Pokorny 1959:1177); the relation between the two reconstructions is not entirely clear.

38. The source of later Oss. *naz/nazu* 'spruce'.

The isolated distribution of Old Iranian **nauča-* and of the later forms Pers. *nājū*, Oss. *nəzy*, with no known correspondences in any other branch of Indo-European,³⁹ suggests that the Iranian forms were borrowed from Kartvelian (cf. Vogt 1938:335, Andronikašvili 1966:347-48), with minimal phonetic changes. If the direction of borrowing were the reverse, from Iranian to Kartvelian, contacts between these languages would have to be posited as early as the period of Proto-Kartvelian unity, no later than the first half of the second millennium B.C.

4.1.10. Alder

4.1.10.1. The Indo-European term for alder

Two distinct terms for 'alder' (*Alnus* Gaertn.) can be reconstructed for Indo-European. One is **eliso-/ *aliso-*, attested in the Ancient European dialects: Lat. *alnus* 'alder', Celt. **alisā-* in numerous toponyms and personal names such as *Alisia*, *Alisontia*, *Alisanos* (the latter possibly the name of a god connected with trees); Goth. **alisa* 'alder' (the source of Sp. *aliso* 'alder', cf. Basque *altza* id.), OHG *elira* ~ *erila* (Ger. *Erle*), OIcel. *alr*, OE *alor*, Engl. *alder*; OPruss. **alskande* (written *abskande*), Lith. *alksnis*, OCS *jelŭxa*, Russ. *ol'xa* 'alder'. OMac. *āliza* 'white poplar' (*hē leūkē tōn déndrōn*. *Makedónes* — Hesychius) may also belong here.

A term which must be older, to judge from its dialect distribution, is represented by **wer-n-*, whose semantics is not entirely clear due to later shifts in some dialects: in addition to 'alder' and 'poplar' in some dialects, it has the meanings 'log', 'beam', and 'mast' in others: Skt. *varaṇa-* 'tree sp. with medicinal properties' (cf. Mayrhofer 1976:III.149), Arm. *geran* 'log', Alb. *verrë* 'white poplar', Bret. *gwern* 'alder; mast', OCor. *guern* 'mast', *guern-en* 'poplar', MIr. *fern* 'alder; mast'.

Various species of alder (*Alnus barbata*, *Alnus viridis*, *Alnus glutinosa*) have been widespread since the Atlantic period from the Caucasus and Transcaucasus to the more northerly regions of Europe and Central Asia (cf. Nejštadt 1957:293). The word **eliso-/ *aliso-*, found in the meaning 'alder' only in the Ancient European group of dialects, spoken in areas where the alder is abundant, can be considered an innovation which replaced the older **wer-n-* 'alder' in these dialects.

39. Unless the isolated Iranian term 'spruce; fir' is to be considered ultimately related to the Proto-Indo-European term for 'boat', **nāu-*: Skt. *nāu-ḥ* 'ship, boat', Gk. (Hom.) *nēūs* 'ship', OIr. *nāu* id.

4.1.11. Nuts and nut trees

4.1.11.1. Proto-Indo-European 'nut'

Two different terms for 'nut' can be distinguished among the Indo-European dialects. The first is represented by Gk. *káruon* 'nut' (especially 'walnut'), *karúā* 'nut tree'; cf. Gk. *árua* 'nuts' (Hesychius), Alb. *arrë* 'nut; nut tree', ORuss. *orëx* 'nut', *orëšie* 'nut trees', Russ. *orex* 'nut, walnut', Serbo-Cr. *òrah*; Lith. *riėšutas* 'nut, walnut', *ruošutys* 'hazelnut', *riėšutynas* 'nut tree'. The protoform is reconstructed as **qh̥ar-* 'nut; nut tree', with dialect reflexes of the initial postvelar as *k-* and *Ø-* (see I.2.4.6 above). Hitt. *GiŠharau-* 'poplar' may also belong to this set (see Tischler 1977-I.172); if so it shows a distinctive semantic development and a reflex of PIE **qh̥-* as Hitt. *h̥-*.

The second term is **kh̥neu-*, restricted to Italic-Celtic-Germanic: Lat. *nux*, gen. *nucis* 'nut' (a suffixed form in **-kh̥-*), OIr. *cnú*, Welsh *cneuen*, MCor. *knyfan* 'nut'; OIcel. *hnót*, OE *hnutu* (Engl. *nut*), OHG (*h*)*nuz* (Ger. *Nuss*) 'nut' (from a suffixed form in **-t̥-*). In this dialect group there is a second term referring to the nut tree itself, **kh̥os(e)lo-*: Lat. *corulus* '(hazel)nut bush', *columnus* (from **korulinos*) 'made of nut wood'; OIr. *coll* 'nut tree', OHG *hasal(a)* (Ger. *Hasel*), OE *hæsel* (Engl. *hazel*), OIcel. *hasl* 'nut tree'; OHG *hesilīn*, OE *hæslen* 'made of nut wood'.

Both the phonetic archaism of **qh̥ar-* 'nut; nut tree' and its wider dialect distribution (Greek-Indo-Iranian, Albanian, Balto-Slavic) testify to the more ancient standing of this root relative to that of Italic-Celtic-Germanic **kh̥neu-* 'nut'. This latter group of dialects has obviously replaced the original word with two new terms, **kh̥neu-* 'nut', referring to the fruit alone, and **kh̥os(e)lo-* 'nut tree', referring only to the plant. This innovation in one group of Ancient European dialects was evidently connected with the appearance of new species of nuts and nut trees in the new ecological surroundings of the speakers of these dialects.

A characteristic feature of the Ancient European terms for 'nut' and 'nut tree' is that they referred primarily to the hazelnut and hazel bush or tree (*Corylus avellana* L.), which is common throughout Central Europe beginning with the Atlantic period (Nejšťadt 1957:282). Hazelnuts, like acorns, have been widely used for food since ancient times (cf. Clark 1952:59ff. [1953:66ff.]). The terms for hazelnut, **kh̥neu-*, and nut tree, **kh̥os(e)lo-*, in the Ancient European dialects did not originally refer to the walnut (*Juglans regia* L.) and walnut tree, which became known in central Europe only much later. In Latin the walnut and walnut tree are called by the transparently secondary term *iūglāns* (etymologically 'Jupiter's (*Iouis*) acorn (*glāns*)', Ernout and Meillet 1967:326), while in the Germanic languages the term 'walnut' (OE *wealh-hnutu*) is derived from a compound meaning 'Gaulish (or foreign) nut' (cf. Lat. *nux*

gallica with the same meaning).⁴⁰ The other, ancient, Indo-European stem *q^har- apparently referred primarily to the walnut (*Juglans regia* L.), as is reflected in the meanings of the Greek and Albanian descendants.

4.1.11.2. The historical range of the walnut

The walnut has been known since ancient times in the area from the Transcaucasus and Iran to Asia Minor and the southern Balkans. In classical antiquity, not only wild but also cultivated walnuts were known in Greece. In central Europe and the northern Black Sea area there is no trace of the walnut until recently, although there is evidence of it at a considerable time depth in the lower Volga region (Nejštadt 1957:267, Frenzel 1960:391, Semenov 1974:27). With the migration of Indo-European tribes into areas where the walnut was absent but the hazelnut common (*Corylus avellana* in Europe; other species in the Near East, e.g. *Corylus colurna* in Asia Minor, *Corylus maxima* and *Corylus caucasica* in the Caucasus), the ancient name for walnut could either be transferred to the hazelnut (as in Latv. *riēksts* ‘hazelnut; water chestnut; acorn’, OPruss. *buccareisis* ‘beechnut’) or lost and replaced by new terms for ‘hazelnut’ and ‘hazel tree’, as in Italic-Celtic and Germanic.⁴¹

4.1.12. Apple tree and apple

4.1.12.1. The Ancient European terms for ‘apple’

A word for ‘apple’ is especially well attested in the Ancient European dialect group: in Celtic, Germanic, and Balto-Slavic. The proposed protoform for these dialects is *āblu-, *āb(a)lo-, and (for Germanic) *aplu-, *ap(a)la-. Gaul. *avallo* ‘apple’ and the toponyms *Aballō* (an *n*-stem), Fr. *Avallon*, OIr. *ubull* (**ablu*) ‘apple’, Welsh *afal*, Corn., Bret. *aval* ‘apple’, Mlr. *aball* (from **abalnā*) ‘apple tree’ (see Holder 1961-1962:III.470). OCS *ablŭko* ‘apple’ (**ablŭ-ko-*), Bulg. dial. *ablŭko*, *jabol* ‘apple’, Cz. *jablko*, *jablo* ‘apple’, OPol. *jabłto* ‘apple’, ORuss. *jabl’ko*, Russ. *jabloko* ‘apple’, ORuss. *jabolon’*, Russ. *jablonja* ‘apple tree’. OPruss. *woble* ‘apple’ (**ābl-*), *wobalne* ‘apple tree’ (**āboln-*), Lith. *óbuolas*, *óbalas* ‘apple’, Latv. *ābele* ‘apple’. OIcel. *apal-grár* ‘apple-gray’, *epli* ‘apple’, *apaldr* ‘apple tree’; OE *æppel*, *apuldor* ‘apple tree’,

40. In western Europe the walnut is attested in southern France as early as the Mesolithic: see Semenov 1974:27.

41. In those dialects which preserve the inherited word for ‘walnut’ in the meaning ‘hazelnut’ as well, special words are formed for ‘nut tree’, ‘hazel tree’: Lith. *lazda*, Latv. *lazda*, OPruss. *laxde* ‘nut tree’, Alb. *lethi* ‘hazel tree’ beside Serbo-Cr. *lijeska* ‘hazel tree’ (Mühlenbach and Endzelin 1923-1932:II.433).

OHG *apful*, *afful* (Ger. *Apfel*) 'apple', MHG *apfalter* 'apple tree', Crimean Goth. *apel* 'apple'. Also related to these may be the Latin toponym *Abella*, an Oscan city in Campania, cf. *Abella malifera* 'apple-bearing Abella' in Virgil (Aeneid VII, 740) and the above-mentioned Gaulish toponyms.

This whole set of terms is characterized by a consistent opposition of 'apple' to 'apple tree', the latter usually an **-n-* derivative (but in Germanic a compound with **t'reu-* 'tree'):

	Celtic	Germanic	Baltic	Slavic
'apple'	<i>*ablu</i>	<i>*aplu</i>	<i>*ābl-</i>	<i>*ablu</i>
'apple tree'	<i>*abalnā</i>	<i>*ap(a)l-triu</i>	<i>*ābol-n-</i>	<i>*abl-on-, *abol-n-</i>

The term for 'apple' lacks a vowel between the **b* or **p* and the **l* in all four branches, while in the derived term for 'apple tree' a vowel may appear there. The four protoforms are phonetically somewhat distinctive.

The reconstructed form is phonologically unusual in its root structure and in containing the labial stop **b*, extremely rare in early Indo-European; this has led some investigators to posit a borrowing into the Ancient European dialects from some non-Indo-European source. However, despite their distinctive phonological shape, the forms have sufficiently regular correspondences in the four branches⁴² that they must be native to the Ancient Indo-European dialect group.

4.1.12.2. *The economic and cultic significance of apples in ancient Europe*

The native status of the Ancient European term for apple is further justified by the special significance of apples as edible fruit and as a cult symbol in ancient European traditions. The apple tree (*Malus pumila* Mill.) is common throughout all of Eurasia with the exception of the northernmost and tropical regions. Apples are found as early as the European Neolithic, but are cultivated only much later (Firbas 1949:189, Clark 1952:115 [1953:122], Semenov 1974:26). Subsequently, apples become an important part of the diet of the tribes inhabiting Europe. According to Tacitus (*Germania*, 23), the Germanic tribes lived for the most part on 'wild apples' (*poma agresta*, which may have included other wild fruits as well), venison, and 'sour milk'.

42. Hence there is no reason to consider these forms loans from Celtic into the other dialects; cf. the analogous conclusions in Pokorny 1959:2, P. Friedrich 1970:63, Trubačev 1974:I.46 (with further references).

4.1.12.3. *The term for 'apple' as a Proto-Indo-European word*

The restriction of **ablu-/ *aplu* 'apple' to the Ancient European dialects could be taken as evidence that the word appeared in this area at a relatively late stage of Indo-European dialect groupings. Such a conclusion is supported by the absence of any reliable correspondent in other ancient dialect groups.⁴³ Discovery of a cognate to the Ancient European form in any other dialect group would enable us to project the word 'apple' back to an earlier dialect stage. A Hittite form *šam(a)luwanza* 'apple, apple tree' fits in well here.

In the Hittite text KBo XVI A 16 the Sumerogram *GIŠHAŠHUR-lu-wa-an-za* 'apple tree' corresponds to the phonetic writing *ša-ma-lu-wa-an-za*, which proves their identity and establishes the meaning of *šamaluwanza* as 'apple tree' (Laroche 1971a:149). This is a derivative with the active suffix *-ant-* from the stem *šam(a)-lu-* 'apple' (cf. the obviously relevant Palaic *šamluwa-*, Laroche 1971a:149).

Comparison of Hitt. *šam(a)lu-* 'apple' with the Ancient European terms for 'apple' and 'apple tree' allows us to consider them cognate formations from a Proto-Indo-European base **šam(a)lu-* 'apple'. Indo-European initial **š-* is reflected as Hitt. *š-* : other I-E *Ø-*; cf. the same correspondence in such forms as Hitt. *šankui-* 'claw, nail' : Lat. *unguis* id., Gk. *ónuks* 'claw'; Hitt. *šakuni-* 'spring' : Slav. **okni* id., Lith. *akìs* 'eye of water', i.e. 'spring' (cf. I.2.4.2 above).

Thus the ancestral form of the Ancient European words for 'apple' can now be reconstructed as **amlu-*.⁴⁴ In word-medial position the sequence **-ml-*, regularly reflected in Hittite as *-m(a)l-*, in the other dialects evidently goes through an intermediate stage **-mbl-*, **-mpl-* to yield **-bl-*, **-pl-* (the latter in Germanic).⁴⁵ Hence Celtic-Balto-Slavic **āblu-*, Germanic **aplu-*, and Hitt.

43. Unless we consider Dardic (Pashai) *wālī* 'apple' (Fussman 1972:II.280-82) somehow etymologically related to Ancient European **ablu-* ~ **aplu-*.

44. The hypothetical **amlu-* 'apple' underlying the Ancient European cognates finds real-life attestation in Proto-Turkic **alma-* 'apple', which many Turkologists have considered an Indo-European borrowing from an unknown source (Sevortjan 1974:138; G. Morgenstierne, pers. comm.). A borrowing from Iranian into Turkic must be ruled out on phonetic grounds: Iranian has *-r-*, Turkic *-l-* (on the Iranian forms see below). In Turkic, Ancient European **amlu-* yields attested *alma* as a result of minor phonetic adjustments. Thus we can establish a source for Proto-Turkic **alma-* 'apple' with a sufficient degree of certainty. The penetration of an Ancient European word into Turkic languages at the level of Proto-Turkic testifies to contacts between the two groups at the time of Ancient European and Proto-Turkic.

45. The development of *-ml-* > *-mbl-* > *-bl-* and *-mr-* > *-mbr-* > *-br-* is obviously due to a universal phonetic tendency to break up sonorant clusters by insertion of a homorganic voiced stop, attested in many Indo-European dialects (cf. the partly similar breaking of fricative-sonorant clusters in the development of *sr* > *str* in many Indo-European dialects, I.7.4.3n19 above): Gk. *blūtō* 'trim honeycombs' (from **mlityō*), *ámbrōtos* 'immortal' (from **amr̥tos*); Arm. *t'm(b)rim* 'grow deaf'; Mlr. *bláith* 'soft' beside OIr. *mláith*, Mlr. *bligim* 'milk' (verb) from **mligim*, *blicht* 'milk' beside *mlicht*; ORuss. *blin* 'beside *mlin*') 'pancake' (Russ. *blin*) beside USorb. cognates *blinc*, *mlinc*; and others.

For IE **šamlu-* 'apple' the change of **-mbl-* to **-bl-* in one dialect group must be

šam(a)lu- can be reduced to a common archetype **šamlu-* and a word for 'apple' can be projected back to the Proto-Indo-European period before the beginning of the dialect dispersal.⁴⁶

4.1.12.4. *Parallels to Proto-Indo-European 'apple' in non-Indo-European languages of the Near East*

PIE **šamlu-* 'apple', 'apple tree' and its Hittite descendant *šam(a)lu-* with preserved initial sibilant are strikingly similar to Hattic *šawat* 'apple, apple tree' (Friedrich 1952:318, Hoffner 1974:114). If we assume for this word an alternation of Hattic *-t* with *-l*, as in a number of other words (e.g., Hatt. *tabarna* 'ruler': Hitt. *Labarna-*, and others; for the alternation of *-t* and *-l* word-finally in Hattic see also Kammenhuber 1969:460-61), and allow for the entirely plausible phonetic alternation of *-w-* and *-m-*, the Hattic word for 'apple' turns out to be almost identical to the reconstructed Indo-European protoform.

The phonetic similarity of these ancient names for 'apple' to Proto-Kartvelian 'apple', reconstructed as **wašl-*, now becomes extremely interesting: Geo. *vašl-*, Ming.-Laz *uškur-*, Svan *wisgw/usgw*. The term for 'apple' may well have been an ancient migratory word which penetrated into a

posited at an early stage of their separate development. A close analog to this process in these dialects can be seen in the historical evolution of **-mr-* in formations in **-ro-* from the Indo-European root **om-/m-* 'unripe, raw, bitter': Skt. *amlá-*, *amblá-* 'sour', OMac. *abro-* 'severely', Alb. *tamlë* 'sour milk', *tëmbëlë* (*tëmbël*) 'gall'; Germanic shows the stem **ampra-* ~ **apra-* (with inserted voiceless *p*, unlike the voiced *b* of the other dialects): OE *ampre*, OHG *ampfaro* 'sorrel' (Ger. *Ampfer*), Olcel. *apr* 'spicy, hot (to taste)'. The appearance in Germanic of the voiceless [p] in **-mr-*, **-ml-* sequences, rather than the voiced [b] of the other dialects, is clearly due to the lack of a voiced stop [b] in such positions in early Germanic, where the earlier 'voiced aspirates' had already become fricatives (see I.1.5.1 above). A comparable phonetic development at a later period yields a voiced *-b-* in the individual Germanic languages, since by this time they had already developed independent voiced stop series: Olcel. *timbr*, OE *timber*, OHG *zimbar* 'timber, building' beside Goth. *timrjan* 'build' (from PIE **t'em-r-* 'build'); OE *sim(b)le*, *simblon*, OHG *simble(s)*, *simblum* 'always' beside Goth. *simlë* 'sometime' (from PIE **sem-l-*).

Hence the appearance of voiceless *-p-* in Germanic to break up the inherited cluster **-ml-* in the word for 'apple' and the development **-ml-* > **-mpl-* > *-pl-* can be explained by the specific phonetics of ancient Germanic. A trace of the sequence **-mpl-* may be preserved in the geminated **-ppl-* of OE *æppel*, Engl. *apple*. In the other dialects the sequence **-mbl-* is simplified to *-bl-*, attested in the Celtic and Balto-Slavic forms.

46. This reconstruction of PIE 'apple' may also extend to Sanskrit *āmrá-* 'mango tree' (*āmrāḥ*, masc.) and 'mango' (*āmrām*, neut.), with a transfer of the original meaning to a fruit tree common in India. In the Kafir group the same word means 'pomegranate': Ashkun *am'ər*, Kati *am'är*, *amrā*, Prasun *am'ər*, etc. (Fussman 1972:1.183). The earlier Iranian meaning of this word, 'apple' and not 'pomegranate', is probably reflected in Finno-Ugric borrowings from Iranian: Liv. *unär*, Mordv. *unaf*, *maf* 'apple' (Sevortjan 1974:138).

The etymology of Skt. *āmrá-* proposed earlier by Pokorny (1959:777), linking it to the root **om-* 'raw, bitter', is unsatisfactory on both semantic and phonetic grounds: for the phonetics cf. Sanskrit formations in **-ro-* from the same root: *amlá-*, *amblá-* 'sour', Lat. *amārus* 'bitter'.

number of languages in the ancient Near Eastern cultural area.

The ancient center of domestication of apples (*Malus pumila* Mill.) is considered to be the mountainous regions south of the Transcaucasus, see P. Friedrich 1970:58. The domestication of the apple was one of the most important cultural achievements after the Neolithic revolution in the Near East. From this center, varieties of cultivated apples subsequently entered other regions of Eurasia. Hence the dispersal of a migratory term for 'apple' from this area, where the domestication of the apple took place, is entirely plausible.

4.1.12.5. Hittite *maḥla*- 'grapevine' and another ancient dialect term for 'apple'

Another ancient term for 'apple' and 'apple tree' in Indo-European is Hom. Gk. *mēlon* 'apple', *mēléa* 'apple tree', Dor. *mālon* 'apple', also 'pear, fruit (of tree)'; a derivative of this meaning can be seen in the poetic *mēlon* 'cheeks'. A cognate can be found in Alb. *móllë* 'apple', and possibly also in Toch. A *malañ* (pl. tantum), B *meli* 'nose' (originally 'cheeks'[,?], as in Greek), with the loss of the original sense 'apple', which may be due to the ecological conditions in which the Tocharian-speaking tribes lived, cf. P. Friedrich 1970:60).⁴⁷ Also related are Lat. *mālum* 'apple' and *mālus* 'apple tree', which show regular phonetic correspondences to Gk. *mēlon* and its cognates.⁴⁸

Hitt. *maḥla*- 'grapevine' must also be compared with these words. The etymological connection of the Hittite word with those for 'apple' and 'apple tree' can be explained by a semantic shift in Hittite: 'apple', 'fruit tree' becomes 'grapevine'. Since Hittite had a word *šam(a)luwant*- meaning 'apple', a semantic transfer of *maḥla*- to another species of fruit-bearing plant is entirely plausible. The shift from 'apple tree' to 'fruit tree' to 'grapevine' may have to do with how these plants and their fruits were used (cf. P. Friedrich 1970:61ff.); for an analogous shift from 'tree' to 'vine' cf. Lat. *ūua* 'bunch of grapes', corresponding to Oícel. *ýr* 'yew', Russ. *iva* 'willow', etc., see 4.1.8.1 above.

47. The apple tree has a limited distribution in Central Asia, becoming less and less frequent farther east (Vavilov 1959-1965:I.347), and is missing entirely in the tropical regions of South Asia, including India (which may explain the semantic shift in Skt. *āmrá*-, see above). Hence it is implausible that the Indo-European term for apple should be traced to Burushaski (Berger 1956:27-34, Watkins 1971:1500), especially since the Burushaski form can be linked to Pamir Iranian terms. The forms in most Pamirian languages go back to **marna*- (Shugni *mūn*, Rushan *māwn*, Yazgulami *mawn*, Ishkashmi *mend*, Sanglechi *meḷ*, Munjan *amingá*, Pashto *maṇa*): Paxalina 1975:224, Grjunberg and Steblin-Kamenskij 1976:394. Pers. *amrūd* 'pear' may go back to a form **amru*-, with a semantic shift from 'apple' to 'pear'.

48. In the case of Lat. *mālum* it is impossible to determine on the basis of phonetic correspondences alone whether the word is an inherited one with regular correspondences between Greek and Latin or a loan from Greek into Latin with formal identity. The forms are closely correlated, but the nature of the correlation could be determined only on the basis of extralinguistic factors. But in this case even cultural and historical factors do not unambiguously support borrowing of Latin *mālum* from Greek.

By comparing these words we can reconstruct an Indo-European protoform **maHlo-* ‘apple; apple tree; fruit tree’. Hence two words for ‘apple, apple tree’ must be posited for Indo-European: **šamlu-* and **maHlo-*, which may originally have denoted different varieties of apple (possibly wild and cultivated),⁴⁹ a fruit which must have been extremely common in the Proto-Indo-European homeland and which must have played a substantial role in the economy and world view of the Indo-Europeans.

4.1.12.6. *The mythological role of the apple in ancient Indo-European traditions*

While there is a considerable variety of mythological motifs connected with apples in the separate Indo-European traditions (e.g., the Greek myth of the ‘apple of discord’, possibly going back to a conception of the apple as a victory prize, Dumézil 1968:584), some of them are repeated in various traditions, which may point to their common origin and reflect Proto-Indo-European ritual and mythological conceptions.

One Proto-Indo-European motif may be that of golden apples which give immortality and eternal youth and are therefore frequently stolen. They are guarded by a female deity. In Greek tradition this motif appears as the myth of the golden apples which grow on the ‘Isles of the Blest’ on the western edge of the world under the guard of the Hesperides (the daughters of Hesperos) and a dragon. In Old Icelandic myth, golden apples which give eternal youth and immortality belong to Iðunn, the wife of the god of poetry Bragi (cf. Oícel. *bragr* ‘poetry’). They are stolen, together with Iðunn, from the gods, then the gods steal them from the giants, who, deprived of their ‘apples of immortality’, begin to age (Meletinskij 1970).

In the Baltic and Slavic traditions the motif of golden apples (Latv. *zēlī' ābuoli*) is also connected with mythic personages — with the ‘sons of God’ (Latv. *dieva dēli*), who are to ‘rock’ (Latv. *ritēt*) the apples (in Latvian folk songs), and with Lightning (Serbo-Cr. *Múnja*), who plays with apples together with Thunder (in Serbo-Croatian folk songs, Ivanov and Toporov 1974:18, 21). In Slavic folklore, an apple tree also takes on the role of the Cosmic Tree, in whose top four apples grow and a bird roosts, while the Serpent nests at its roots (Ivanov and Toporov 1965:81).

The ancient Germanic mythic motif links ‘apples of immortality’ with the god of poetry Bragi. His name is etymologically related to **bhreu-* ‘ferment (of beverages); brew’, cf. OE *brēowan*, Engl. *brew*, OHG *briuwan*, Ger. *brauen*, and also Lat. *ferctum* ‘sacrificial cake made of groats, butter, and honey’, Lith. *biřgelas* ‘beer’, etc. This may be evidence that apples were used to

49. Cf. the two varieties of apple tree in Hittite: *GIŠHAŠHUR* ‘apple tree’ and *GIŠHAŠHUR.KUR.RA* ‘mountain (i.e. wild) apple tree’.

prepare a ritual beverage that was a functional correspondent to wine, beer, and other intoxicating beverages.⁵⁰

4.1.13. Cherry and cornel cherry

4.1.13.1. The Indo-European name for 'cornel cherry' and 'cherry'

Cognates referring specifically to the cornel cherry can be seen in Gk. *krános* (masc. and fem.) 'cornel cherry tree', *kránon* 'cornel cherry', Hom. *kráneia* 'cornel cherry tree', Lat. *cornus* id., *cornum* 'cornel cherry'. The word goes back to an Indo-European protoform **k^hṛno-*, with zero grade. Alb. *thánë* 'cornel cherry' is probably also cognate, as clearly is OLith. *Kirnis* '*deus cerasorum*', the 'god of cherries'. Although the Old Lithuanian form corresponds exactly to the Latin and Greek cognates, there is a semantic discrepancy: the term means 'cherry', not 'cornel cherry'. This is a natural shift, given the predominance of cherries over cornel cherries in the territory historically occupied by the Baltic tribes; cherries and cornel cherries are very similar in physical appearance and taste. The same root in the form **k^her-* may underlie Gk. *kérasos* 'cherry tree' (cf. *kerasía* id., *kerásion* 'cherry'), which may be of Near Eastern provenience, cf. the city name *Kerasoûs*, in the Pontic region of Asia Minor (Frisk 1954:I.7).⁵¹

Based on its dialect distribution, the word may be considered an archaic Indo-European formation with the meaning 'cherry, cornel cherry', cf. P. Friedrich 1970:115ff.

4.1.13.2. The range, economic use, and mythic role of the cornel cherry and cherry

The cornel cherry (*Cornus mascula* L.) grows primarily in the more southerly regions of Europe, in the Caucasus, and in the Near East. The cherry (*Prunus cerasus*) has a much wider range in Eurasia, and is attested in cultivated form in the Near East as early as the seventh to sixth millennia B.C. Baltic tradition

50. If apples were used in ancient times to make an intoxicating beverage (at first, obviously, for ritual purposes) such as mead or wine, this fact would explain the semantic shift of 'apple' to 'grapevine' posited above for Hittite *mahla-*.

51. Gk. *kérasos* 'cherry' is borrowed into Latin in the form *cerasus*, VLat. **cerasia*, the source of OFrench *cherise*, Fr. *cerise*, in turn the source of ME *cheri*, Engl. *cherry*. The same Vulgar Latin source apparently yields OHG *kersa*, Ger. *Kirsche* 'cherry'. Slavic **čeršinya* (Russ. *čerešnja*) 'cherry' is usually traced to the same source: Vasmer 1958:III.324 [1964-1973:IV.343].

attests a special god *Kirnis*, the protector of cherries.⁵²

In ancient times cornel cherries were widely used, together with acorns and beechnuts, as fodder for pigs. A well-known passage from the *Odyssey* highlights this fact (10.241-43):

...τοῖσι δὲ Κίρκη
 πὰρ ῥ' ἄκυλον βάλανόν τ' ἔβαλεν καρπὸν τε κρανείης
 ἔδμεναι, οἷα σύες χαμαιευνάδες αἰὲν ἔδουσιν
 'And Circe tossed them
 acorns, mash and cornel berries — fodder
 for hogs who rut and slumber on the earth.'

Approximately the same sphere of meanings, 'fruits' = 'fodder for livestock', is expressed by PIE **k̑her-*, the source of Alb. *thjer* 'acorn', *thjerrë* 'lentils' (**k̑her-n-*), OHG *hirso* 'millet', Lith. *šerti* 'feed (livestock)', *pāšaras* 'fodder', Lat. *crēscō* 'grow', *crēber* 'growing thickly'; the name of the Italic fertility goddess is also related: Lat. *Cerēs*, Osc. *Kerrí* (Pokorny 1959:577). The Italic goddess was the protector of fruit trees and orchards (cf. Osc. *húrtín Kerrúin* 'sacred orchard of Ceres') and is in this respect the equivalent of the Lithuanian god of cherries *Kirnis*. During the *Cerialia* ritual, pigs were sacrificed to the Italic goddess (Dumézil 1966:367-68).

The roots **k̑h̑r-n-* 'cherry, cornel cherry' and **k̑her-* 'grow; fodder' may be connected, a possibility which raises the question of whether the velar **k̑h* of the first root corresponds formally to the palatovelar **k̑h* of the second. The two forms can be reduced to a single source form **k̑her-* if we assume neutralization of the palatality feature before the **r* of the zero-grade root form: **k̑her-* (Lith. *šerti*) ~ **k̑h̑r-n-* (Lith. *Kirnis*). (See I.2.3.4 above for this neutralization, reflected in such forms as Lith. *kārvė* 'cow' ~ *stirna* 'roe deer'.)

4.1.14. Mulberry

4.1.14.1. The Indo-European name for 'mulberry'

An Indo-European word for 'mulberry (tree and fruit)' may be reconstructed as **mōro-*, attested in a number of ancient dialect areas: Gk. *móron* 'mulberry (fruit and tree)', 'blackberry' (with derivative *moróeis* 'mulberry; dark in color': *hértata moróenta* 'mulberry-colored earrings' in Homer); Arm. *mor*,

52. A later Baltic term for 'cherry' — OPruss. *wisnaytos* 'cherry', Latv. *vīksna* — is considered a loan from Slavic, cf. Russ. *višnja*. The Slavic term is related to Gk. *iksós* 'mistletoe; birdlime', Lat. *uiscum* 'mistletoe; birdlime from mistletoe berries', OHG *wīchsila* 'black cherry' (Ger. *Weichsel*), PIE **wīk̑hs-*.

mori, moreni 'blackberry'; Lat. *mōrus* 'mulberry tree', *mōrum* 'mulberry', 'blackberry' (ancient forms in *-s* meaning 'tree, plant' and *-m* meaning 'fruit, berry'), Welsh *merwydden* 'mulberry' (with **e* grade in the root). The dialect distribution of the forms (Greek, Armenian, Italic-Celtic)⁵³ testifies to their antiquity in Indo-European in the meanings 'mulberry' and 'blackberry'.

That the meaning 'mulberry' is older can be seen in the early Greek meaning of *mōron* and its derivatives in Homer, as well as in the archaic opposition of *-s* and *-m* forms denoting respectively the plant and the fruit in Latin; moreover, Lat. *mōrus* means only 'mulberry tree' and not 'blackberry plant' (whereas *mōrum* means both 'mulberry' and 'blackberry'), while another ancient word *rubus* (from PIE **wṛdh-o-s*, see Schulze 1933: Skt. *várdhati* 'grows', *vṛddhá-* 'full-grown') denotes the blackberry plant. Semantic extension of 'mulberry' to 'blackberry' could have been based on the similar form and color of the two berries.

In Celtic the form means only 'mulberry'. Armenian has only the secondary meaning 'blackberry', the meaning 'mulberry tree' being expressed by a loan *t'ut'*, probably from Aramaic (Hübschmann [1897] 1972:155).

The meaning 'dark-fruited mulberry tree', 'dark-colored fruit of mulberry tree' is of Proto-Indo-European date, as is confirmed by its possible etymological connection to **mer-*, **mor-* 'dark, black' (Pokorny 1959:734): Hom. Gk. *morússō* 'blacken, make dirty', *memorugménos* 'dirty', *mórukhos* 'black (with soot)'.⁵⁴

4.1.14.2. The range and economic significance of the mulberry

The black mulberry (*Morus nigra* L.) is a common fruit tree in the Mediterranean and in southwestern Asia; its original center of dispersal is considered to be the Near East (Vavilov 1959-1965:I.344). Its large fruits, distinguished by their deep purple, almost black color, are used for food in a number of high mountain regions of the Near East and the Pamirs of Central Asia (the fruits when dried provide flour which replaces grain flour); the leaves are used for livestock feed, and the wood is a valued building material (Vavilov 1959-1965:I.205, 343). A closely related species of mulberry (*Ficus sycomorus*) was used for shipbuilding in ancient Egypt (Semenov 1974:28). The Egyptian

53. The Germanic forms (OHG *mūr-*, *mōrbere*, MHG *mülber* 'mulberry') and Lith. *mōras* id. are regarded as loans from Latin (Pokorny 1959:749).

54. The same original root is probably also the source of another Greek term for a tree with dark fruits: *moríā*, the sacred olive tree in Athens, dedicated to Athena, cf. *mórios Zeús* 'Zeus, protector of sacred olive trees'. However, despite its archaic structure the Greek word finds no correspondents in this meaning in the other languages. Another Greek term for 'olive tree', *éla(w)ion*, attested in Mycenaean *e-ra-wo*, has a cognate in Lat. *oleum* 'olive tree' and can be considered fairly ancient in terms of dialect distribution, going back to an early dialect grouping (unless Lat. *oleum* is a loan).

sycamore *nh.t* was a 'tree sacred to the gods' and had great ritual and mythological significance.

Another type of mulberry, the white mulberry (*Morus alba* L.), is known in eastern Asia; its center of dispersal is considered to be China (Vavilov 1959-1965:V.146), where it was originally used for raising silkworms. From there the white mulberry spread, together with the production of silk, to the west. The spread of the white mulberry and its new domestic function could have been the reason for the ousting of the inherited word for 'mulberry' in a number of Indo-European dialects which have lost the original word altogether (like Indo-Iranian)⁵⁵ or retained it only in its secondary meaning 'blackberry'.

4.2. Flora: Cultivated plants and grains

4.2.1. Grape and wine

4.2.1.1. Terms for wine in the ancient Indo-European dialects

Despite the considerable diversity of terms for 'grape' and 'grapevine' in the Indo-European daughter languages, the word for 'wine', **w(e/o)ino-*, is characterized by extreme stability across the various branches and shows regular phonetic correspondences among the main ancient dialects:⁵⁶

Hitt. *wiyana-* 'wine', Luw. *winiyant-* 'wine', Hier. Luw. *wiana-* 'wine', Laroche 1959a:111 (PIE **wi(o)no-*, with zero grade).

Myc. Gk. *wo-no-* 'wine' (especially in compounds such as *wo-no-qo-so* = *woînops*, cf. Homeric *oînops* 'dark red', literally 'wine-red'); Hom. *oînos* 'wine' (i.e. grape wine, dark red in color, cf. *oînon eruthrôn* 'red wine', Odyssey 12.19) with numerous derivatives (e.g. *oînô-pedon* 'vineyard' and others): PIE **woino-* with *o* grade, cf. Arm. *gini* 'wine' (**woinyom*), Alb. *vënë*, Tosk *verë* 'wine' (**woinā*).

Lat. *uînum* 'wine' (cf. Falisc., Volsc. *uinu*, Umbr. *vinu*, *uinu*, possible loans from Latin): PIE **weino-*, with *e*-grade vocalism. The same Indo-European form, with the same vocalism, underlies the Germanic and Slavic cognates⁵⁷ and their Proto-Germanic and Common Slavic antecedents:

55. The connection of the new term for 'mulberry tree' with silkworm raising can be plainly seen in such neologisms as Waigali *kuñāl'ik* 'mulberry tree', etymologized as **křmuka-lika-* (**křomi-*, cf. II.2.2.1.1n45 above).

56. Here we see a regularity also to be observed elsewhere: the greater stability of the term for the basic food product relative to that of its source, which undergoes frequent lexical replacement in the course of dialect evolution. Compare the similar historical correlations in the terms for the food product 'honey' and its source, the bee, cf. II.3.2.5 above.

57. The Celtic forms OIr. *fin*, Welsh *gwin* 'wine', to judge from their vocalism, can be regarded as loans from Latin, Pokorny 1959:1121 (unless they go back to an Indo-European form with zero grade, as in Anatolian, in which case they are native Celtic forms).

Goth. *wein* 'wine', *weina-* in compounds such as *weinatriu* 'grapevine', *weinagards* 'vineyard', OE *wīn*, Engl. *wine* (cf. also OE *wīn-trēow* 'grapevine', *wīn-bērige* 'bunch of grapes', *wīngeard* 'vineyard'), OHG *wīn* 'wine', Ger. *Wein* (and derivatives OHG *wīn-garto* 'vineyard', *wīnreba* 'grapevine').

OCS *vino* 'wine', Russ. *vino*, Pol *wino*.⁵⁸ Also related to these is an ancient Common Slavic formation preserved only in South Slavic: OCS *vinjaga*, Serbo-Cr. *vinjaga*, Slovene *vinjāga* 'grape' (Bezljaj 1976:217), whose second element *-aga* 'fruit' is cognate to Lith. *uoga* 'berry', Latv. *uōga* id., Toch. B *oko* id. and represents a Common Slavic archaism preserved only in this compound (there is a derivative in *-d-* from this form, also Common Slavic: OCS *agoda* 'berry, fruit', Russ. *igoda*).⁵⁹

The existence of cognates with the meaning 'wine', on the one hand in Anatolian and on the other in Greek, Armenian, Albanian, and Latin, as well as in Germanic and Slavic, is sufficient evidence for positing a form **w(e/o)in-o-* 'wine' for Proto-Indo-European.⁶⁰

4.2.1.2. *The connection of the Indo-European term for wine with Near Eastern terms*

Phonetically similar terms for wine can be found in a number of ancient Near Eastern languages. A term for wine is reconstructed as **wayn-* for Semitic (Fronzaroli 1971:VII.613ff.): Akk. *īnu-*, Arab. *wayn-*, Ugar. *yn*, Hebr. *yayin*. In

58. The corresponding Baltic forms are considered loans from Slavic: Lith. *vynas* 'wine', Latv. *vīns* (the latter form is sometimes traced to MLG *wīn*).

59. There is insufficient formal evidence for considering the Germanic and Slavic terms to be loans from Latin, *contra* Pokorny 1959:1121, cf. Vasmer 1953:I.202 [1964-1973:I.316]. Evidence against such a position is the fact that in these groups the terms for wine go back respectively to a Proto-Germanic and a Common Slavic original form. The native status of the terms is further supported by ancient compounds such as the Proto-Germanic term for 'vineyard', Goth. *weina-gards*, OE *wīn-geard*, OHG *wīn-garto*, and the Common Slavic terms for 'grape(vine)' and 'vineyard' (OCS *vinjaga*, *vinogradŭ*; the structural coincidence of the latter with its Germanic equivalent does not necessarily establish a borrowing from Germanic to Slavic). Ultimately, the claim for a Germanic and Slavic borrowing of the term for wine from Latin is based not on the phonetic properties of the forms themselves, which show regular correspondences, but on cultural-historical assumptions about the original location of grapes and the ancient Indo-European homeland: see Bonfante 1974.

60. Even if we grant cognate status only to the Anatolian, Greek-Armenian, and Latin terms for wine (regarding not only the Celtic and Baltic forms, but also the Germanic and Slavic forms, as borrowings), the dialect distribution of the reflexes still establishes the Proto-Indo-European character of the word.

On the other hand, if we reconstruct a form with lengthened zero grade, **wīno* (yielding Lat. *uīnum*; cf. Lat. *līnum* 'flax' from **līno-*), as the protoform for a certain group of dialects, this removes all formal obstacles to considering the Celtic and Baltic forms as native Indo-European. In this case the Indo-European protoform with lengthened zero grade can be taken as the source (with no need for an alternative form **weino-*, with *e* vocalism) for all the Ancient European dialects.

Egyptian, beginning with the Old Kingdom, we find *wnš* in the meaning 'edible fruit; grape; wine'; cf. also *wnš.t* 'wine' (Erman and Grapow 1955:I.325). In Hattic, *windu-* can be segmented out as an element of compounds with a meaning referring to some beverage (possibly wine; cf. *LŪwindu-kkaram* 'wine steward; cupbearer'; see Kammenhuber 1969:496).⁶¹ For South Caucasian (Kartvelian) a form **ɣwino-* 'wine' can be reconstructed (Geo. *ɣwino*, Ming. *ɣwin-*, Laz *ɣ(w)in-*, Svan *ɣwinel*), and **wenaq-* 'vineyard; grapevine'⁶² (OGeo. *vena-q-*, Ming-Laz *binex-*, Svan *wenäq*): Klimov 1964:203-4, 83.

4.2.1.3. *The term for wine as an ancient Near Eastern migratory word. The migratory word as a native Indo-European one; its etymological connections*

The wide distribution of phonetically similar words meaning 'wine', 'grape' among various linguistic groups of the Near East at a great time depth allows us to regard them as migratory words for 'grape' and 'wine'. The fact that there are etymological links between the 'wine' and 'grape' words within each of the language groups (Indo-European, Semitic, Kartvelian) indicates the extreme antiquity of the migratory term, which must have passed from one language to another at a protolanguage level, i.e. prior to the breakup of each protolanguage into separate dialects.

The formal characteristics of the Proto-Indo-European word for wine, with its regular ablaut grades **(e) : *o : *Ø*, allow us to regard this word, built according to the rules of ancient Indo-European word formation, as a native element of the Indo-European system; we can therefore give it an etymology within Indo-European. The most natural etymology appears to be the connection, long since proposed, of the Proto-Indo-European word for wine with the root **wei-/wi-* 'weave, plait, twist' (Walde 1910; cf. Georgiev 1954:62, Merlingen 1968:411): Skt. *váyati* 'weaves, plaits', Vedic *vyáyati* 'turns', *vyāna-* 'turn'; Lat. *uieō* 'tie, plait, weave', Lith. *vejù* 'weave, plait', Slavic *viti* id., etc.

The Indo-European root meaning 'weave, plait' forms numerous archaic derivatives in the Indo-European daughter dialects referring to twining, flexible plants, branches, twigs, and grapevines:

Derivatives in **-thi-*: PIE **w(e)i-thi-*: Lat. *uītis* 'grapevine'; Avest. *vaēiti-*

61. It is interesting that the second half of the Hattic word coincides with Akkad. *karāru* 'grapevine; wine'. The possibility is not to be excluded that the Hattic word is a compound resulting from combination of the native Hattic word with a Hatticized Akkadian term for 'wine; grape'.

62. There is striking phonetic similarity between the Kartvelian word **wenaq-* 'vineyard' and the Indo-European form **wein-āk-* reflected in Slavic *vinjaga* 'grapevine'. For the connection among terms for wine in Indo-European, Semitic, and Kartvelian see also Cereteli 1947:18ff.

'willow; willow withes', Lith. *vytis* 'willow withes', cf. *žil-vitis* 'brittle willow; vine', Slav. *vitī* 'wicker work' (Serbo-Cr. *pāvīt* 'grapevine'); OIr. *féih* 'fibers', Welsh *gwden* 'string, lace'; OIcel. *víðir* 'willow', OE *wīðig* 'willow'.

Derivatives in **-thu-*: PIE **w(e/o)i-thu-*: Gk. *ítus*, Aeol. *witus* 'willow; rim of wheel', Lat. *uitus* 'rim of wheel';⁶³ Gk. *oísuon* (from **woituo-*) 'willow sp.', OPruss. *witwan* 'willow', *apewitwo* 'pussywillow', OCS *větvī* 'branch', etc.

Derivatives in **-n-*: PIE **woi-n-*: OCS *věničī* 'wreath', Serbo-Cr. *viženac*, Cz. *věnec*, *vínek*, Lith. *vainikas* 'garland, wreath'.

Athematic and thematic derivatives in **-o-*, **-ā-*: PIE **w(e/o)i-o-/-ā-*: Gk. *huiēn* · *ámpelon* 'grapevine', cf. *euiádes* · *ámpeloi* 'grapevines' (Hesychius), Skt. *vayā* 'branch', OCS *věja* 'branch'; Latv. *vija* 'wicker fence'; Mlr. *fé* 'withes' (cf. Welsh *gwial-en* 'twig').

The semantics of these derivatives of **wei-/wi-*, as well as the very meaning of the root 'weave, plait, twist', renders entirely plausible the claim that the Indo-European term for 'grape' and 'wine' is a formation from the same root **wei-* in its various vowel grades — 'fruit of twining plant'. The term could have been differentiated by grammatical gender (evidently first by active vs. inactive class) even in early Indo-European. The form in **-s* would have designated the plant, the grapevine, while the form in **-m* designated its fruit, grapes, and wine.

The Indo-European derivatives meaning 'grape, wine' subsequently spread to adjacent languages and became a typical migratory term, penetrating as far as ancient Egyptian in the form *wnš* 'fruit; grape; wine' (evidently reflecting the Indo-European zero-grade form with the ending **-s*). The Indo-European form was borrowed into Semitic in its *o*-grade form (Semitic **wayn-*), while it entered Hattic (*windu-*) and Proto-Kartvelian (**ɣwino-*) as a zero-grade form.⁶⁴

63. The exact coincidence of form and meaning in Greek and Latin suggests the possibility of a Latin borrowing from Greek (cf. Pokorny 1959:1122); however, in view of the regularity of phonetic correspondences, there is no need to assume borrowing.

64. The opposite direction of borrowing, from Egyptian or Semitic into Indo-European, is less likely on cultural-historical grounds (the grapevine is not found in early Semitic/Egyptian territories). An Indo-European borrowing of the term for wine from Kartvelian (which would be reasonable on the grounds of culture history and the ancient center of dispersion of the grapevine, discussed below) would require a reshaping of the borrowed word in Indo-European, leading to its reanalysis as a derivative of the native Indo-European root **wei-* 'twist, plait'. On the other hand, the antiquity within Kartvelian of **ɣwino-* cannot be established with certainty, nor can it be proven cognate to formations such as **wenaq-* 'vineyard', which has a clearly borrowed character. Note that borrowing of specialized cultural terms does not necessarily presuppose that the culture borrowing the terms lacked the objects or concepts they designate; the Slavic and Eastern Iranian (Ossetic) terms for horsebreeding are borrowed, but these cultures preserve earlier equivalents to the borrowed terms, displaced by the subsequent borrowings: see II.3.1.1.13 above. Given the considerable development of viticulture and wine-making in the ancient Transcaucasus, ancient, native Kartvelian terms for the relevant basic concepts could have been displaced by loans. Further such foreign loans, in addition to **ɣwino-* 'wine' and **wenaq-* 'vineyard', are Geo. *q'wzen-* 'grape' (cf. Urart. *Gišuldini* 'vineyard', see Melikišvili 1960:411) and possibly Geo. *vaz-* 'grapevine' (cf. Arm. *vaz* 'grapevine', of unclear etymology, and Iranian **raz-*: Pehl. *raz*, Pers. *raz* 'grapevine', etc.).

If we posit borrowing of the Indo-European term for 'grape' and 'wine' into the ancient Near Eastern languages at such an early date, we must assume linguistic contacts between Indo-European and the other languages at that early date in the Near East, and we must further assume that the ancient Indo-Europeans were familiar with viticulture and wine-making by the time of these contacts, which, to judge by the Semitic, Egyptian, and Hittic data, must have been no later than the third millennium B.C.

4.2.1.4. *The ancient Near Eastern center of viticulture*

The earliest center of cultivation and domestication of grapes (*Vitis vinifera*) is usually placed in southwestern Asia, with a distinct Transcaucasian area where new varieties of cultivated grape developed and where there was a wide variety of cultivated and wild grapes and a number of transitional types (see Vavilov 1959-1965:II.371, V.145, 160, 166). In the Transcaucasus, traces of viticulture are observed by the time of the Kura-Araxes culture of the fifth to fourth millennia B.C. (Kušnareva and Čubinišvili 1970:170).

4.2.1.5. *Grape and wine in the early Indo-European traditions*

In §§101ff. of the Old Hittite Laws, considerable space is given to laws concerning indemnification for theft, grazing, or other damage to vineyards, grapes, and vines, which shows that viticulture and wine-making were well established by the time of the Old Hittite Kingdom. This is in agreement with the statistical data furnished by Hittite deeds, which show that fairly large amounts of land were planted in grapevines (see Riemschneider 1958).

From the eastern Mediterranean we have data on grape cultivation in the Bronze Age (Clark 1952:116 [1953:122]). Wine-making played an important role in Mycenaean Greece, where extensive stores of wine were discovered in a palace at Pylos (Blavatskaja 1966:77). In Homer there are descriptions of large grapevines (*alōē*), weighted down by 'bunches of black grapes' (*mélanes bótrues*), and of the grape harvest, where youths and girls carry woven baskets to collect the 'honey-sweet fruit' (*meliēdéa karpón*), Iliad 18.561-68.

4.2.1.6. *The Indo-European term for 'sacrificial libation of wine'*

The ritual and cultic significance of wine in the Indo-European tradition has its roots in the distant past. In the traditions of the individual Indo-European dialects, not only the general character of wine-sacrifice rituals, but in fact the

very structure of the ritual formulas enacting them, coincides. An example is Homeric Greek *oînon spéndō* 'pour out wine', 'sprinkle (an animal sacrificed to Zeus) with wine': *spéndōn aîthopa oînon ep' aithoménois hierôîsin* 'sprinkling with dark wine the steaming parts of the sacrifice' (sc. a bull), Iliad 11.775, and Hittite *wiyanit šipant-* 'sprinkle with wine' (an animal sacrificed to the supreme deity): DUTU-i 1 UDU GEŠTIN-it *ši-pa-an-ti* (KUB XXXV II 10) 'sprinkles with wine one sheep (sacrificed) to the sun god' (cf. GIŠGEŠTIN *išpanduzzi-* 'vessel for sacrificial wine'). A further trace of this usage of the term for sacrificial wine in combination with the Indo-European verb **sp̥h₂ent-* 'perform a libation; sprinkle' can be seen in Lat. *spondeō* in its later figurative meaning 'promise on oath' (of any ritual pledge, see Ernout and Meillet 1967:643); for the meaning cf. Gk. *spéndō* 'promise', middle 'make a treaty', *spondaí* (pl.) 'peace; union; treaty'. In Homer the latter also occurs with the word for wine to designate the libation of wine upon concluding a treaty, e.g. *spondaí t' ákrētoi* 'libation of undiluted (wine)', Iliad 2.341, Iliad 4.159 (undiluted wine was used for sacrifice, while people usually drank diluted wine: *aîthopa oînon ... kērōntai* 'they dilute the sparkling wine', Iliad 4.259-60).

In the early Indo-European traditions, the wine cult is associated with the supreme deity — in Greek myth with Zeus the Savior (*Zeûs Sōtēr*) (see Frejdenberg 1936:82 on the 'god of Wine'), in Latin myth with Jupiter. In ancient Rome there was a special ceremony, the *Vinālia*, when wine was sacrificed to Jupiter (Dumézil 1966:188-89). This recalls the Hittite libation of wine poured onto the animal sacrificed to the sun god.

4.2.1.7. *The absence of the Indo-European term for wine and grape from Indo-Iranian and the cult of the 'godly' drink soma/haoma*

The Indo-European character of the Near Eastern migratory term for wine and its etymological connection to a native Indo-European root raises the question of why cognate words for wine and grape are missing from a number of early Indo-European dialects such as Indo-Iranian⁶⁵ and Tocharian. It may be assumed that the place of wine as a cultic and everyday beverage was taken in the Indo-Iranian tradition by other intoxicating beverages, made from plants other than grapes, which replaced grapes in the new ecological conditions where the early Indo-Iranians lived. One such new cultic beverage, dedicated to the supreme deity, may have been soma: Skt. *sōma-* 'soma' (in the Rigveda, the drink of the thunder-hurling god Indra; cf. wine as the drink of Zeus and Jupiter respectively in Greek and Roman mythology). In the Rigveda, over a hundred hymns are dedicated to the apotheosized beverage Soma (Avest.

65. The possibility that terms such as Pamirian Yazgulami *wiḡg-* 'grape' are relics is not to be excluded.

haoma); they praise 'the sweetest, most intoxicating beverage, pressed for Indra to drink': *svādiṣṭhaya mādiṣṭhaya ... īndrāya pātave sutāḥ* (IX, 1, 1).

Soma was a narcotic beverage prepared by pressing the juice out of plants with stone presses. The horsetail (*Ephedra*) is used in this way in later Indo-Iranian traditions; this plant is found in desert regions of Central Asia and Afghanistan, and the names for it in Iranian languages are derivatives of Iranian **hauma*-.⁶⁶

Another intoxicating beverage among the early Indo-Iranians was Skt. *sūrā* (mentioned twice in the Rigveda), in the Sanskrit tradition a crude intoxicating drink used by the lower caste *sūdrā*-.; cf. Avest. *hurā*- 'kumyss', Pehl. *hur*, Avest. *xvarəθō.bairya*-, Parth. *ḥwrybr* 'wine steward', Diakonoff and Livšic 1960:63.

The names of both drinks are formed from the Indo-European root **seu-/su-*, originally 'wring, squeeze out (liquid)', 'press (juice)', 'chase out': Skt. *sunōti* 'squeezes out, presses (juice)', Avest. *hunaoiti*; Skt. *sutā*- 'pressed, squeezed out', OIr. *suth* 'juice; milk', OHG *sou*, OE *sēaw* 'juice'.⁶⁷

The complete replacement of wine by soma in Indo-Iranian culture, in both ritual and everyday functions, was due primarily to new ecological surroundings, and also to the intoxicating properties of the beverage obtained from the plants in the new environment.⁶⁸ The ancient derivatives from PIE **wei-* 'twist, plait', the source of the words for grape and wine in Indo-European, are used in Indo-Iranian only for various species of vines and trailing plants, with no obvious connection to wine and grapes. Similar conditions must have caused the loss of the inherited word for 'wine' and 'grape' in Tocharian.

4.2.1.8. *Traces of ancient viticultural terms in Iranian. The term for 'vine'*

In addition to the above terms, Iranian (or in any event the western Iranian dialects) partly preserves an ancient dialectal terminology pertaining to viticul-

66. Many investigators believe that Indian soma and Iranian haoma were originally made from a particular variety of amanita mushroom (*Amanita muscaria*): Wasson 1968, Elizarenkova 1972:300-301, Steblin-Kamenskij 1974:138-39. On the Greek tradition see Ruck 1976:238ff. On mushrooms in the myth and ritual of various Indo-European folk traditions see also Toporov 1979.

67. The same root yields derivatives in a labial: Skt. *sūpa*- 'soup', OIcel. *súpa*, OE *sūpan*, OHG *sūfan* 'drink; drink noisily' (Ger. *saufen*), *sūf* 'soup'.

The very technology for preparing soma as described in the Rigveda (the juice was pressed out with pressing stones — *grāvan-* — and poured into vessels, where the soma was diluted with water) is overall highly reminiscent of the ancient technique of winemaking practiced by the early Indo-Europeans (in traditions such as the ancient Greek one, herbs were added to the wine to give it strength, since the beverages the ancient Greeks obtained from grapes alone were fairly weak: see Ruck 1976:241-42).

68. In India, where the Indo-Aryans migrated, the grapevine is entirely absent (Vavilov 1959-1965:I.356).

ture, as can be seen from such words as OPers. **raza-* (transmitted via Elamite *ra-ša-*) ‘vineyard’, **razakara-* (Elam. *ra-ša-ka-ra*) ‘winemaker’, Parth. *rz-* (*raz*) ‘vineyard’, *rzkr* (*razkar*) ‘winemaker’, *nwršt(k)* (*navrāštak*) ‘new wine’, Diakonoff and Livšic 1960:44, Pehl. *raz*, Pers. *raz* ‘grapevine’, cognate to OCS *loza* ‘grapevine’, OCz. *loza*, Russ. *loza*.⁶⁹

While the western Iranian languages preserve traces of the early Indo-European viticultural terminology, in the eastern Iranian languages the ancient terms for wine and grape have been completely replaced. The eastern languages have an entire set of new terms referring to other beverages prepared from other plants, and the meanings of the ancient viticultural terms have changed. In particular, in Avestan and also in Ossetic the words cognate to the western Iranian (and Indo-European dialectal) term for ‘grapevine’ have other meanings: Avest. *razura-* ‘grove’, Oss. *ræzæ* ‘fruits; vegetables’ (Abaev 1973:II.398-99). To designate an intoxicating beverage there is a new word **san-*, also attested in Scythian: Oss. *æn* ‘beer’, Adyghe *sanä* ‘wine’ (Abaev 1949:I.180). The Ossetic epics preserve later terms for two ritual intoxicating beverages: mead, *rong* (cf. II.3.2.5.3 above) and the fabled thick *ælüton* ‘beer’ (Abaev 1949:I.338-47, 1958:I.129-31). The original Indo-European terms for ‘wine’ and ‘grape’ are completely lost in the eastern dialects as in the western ones.

4.2.2. Grain and barley

4.2.2.1. The Indo-European terms for ‘grain’ and ‘barley’

An ancient Indo-European word meaning ‘grain’ is **Hat-*, reconstructed on the basis of evidence from several early Indo-European languages, whose dialect group membership confirms the Proto-Indo-European status of the word: Avest. *āδū.fṛādana-* ‘abounding in grain’, Buddhist Sogd. *”dw-k* ‘grain’, OArm. *hat* ‘grain’, Goth. *atisk* ‘seed’, OHG *ezzesc* ‘seed’, Lat. *ador* ‘grain sp.’ (Poetto 1976a).⁷⁰

The ancient Indo-Europeans certainly cultivated barley, as is clear from cognate forms meaning ‘barley’ in the main ancient dialects: the testimony of

69. A proposed protoform is Indo-European dialectal **lēgh-*, originally ‘crawl, creep; spread’: OCS *-lēsti* ‘climb; get in’, LSorb. *lēsc* ‘crawl’ (Vasmer 1953:II.26-27 [1964-1973:II.476, 512]).

70. In the Hittite subgroup of Anatolian, the Proto-Indo-European term for grain is replaced by another word, Hitt. *ḫalki-* ‘grain’, which has a narrower dialect distribution: cf. OCS *zлакū* ‘grain plant, cereal’, Phryg. *zélkia* ‘grain, cereal’ (see Neronak 1978:153). However, the displaced earlier term is retained in these languages with verbal meaning: Hitt. *ḫat-* ‘to dry (fruits)’. For the occasional preservation of the ancient meaning of the term in the Anatolian group, cf. also Lyc. *kθase* ‘pertaining to grain’, Neumann 1974:113-14.

Hittite, Indo-Iranian, and Celtic permits a secure reconstruction of the meaning 'barley' for PIE **yewo-* (with subsequent semantic shifts to a generic term for grain or to other grain species):

Hitt. *ewan* (neut.) (Sumerogram: ŠE-u-wa-an), gen. *ewaš* 'barley' (Laroche 1963:75-76).

Skt. *yáva-* 'grain; barley', Kafir Ashkun, Waigali *yū* 'barley' (Morgenstierne 1954:316), 'millet', Avest. *yava-* 'grain', Pers. *jav* 'barley', Kurd. *Jaw*, Baluchi *Jaw*, *Jō*, Yagnobi *yaṭ* 'barley' (cf. Oss. *jæw* 'millet', Abaev 1958:I.563-64), Ir. *éorna* 'barley';⁷¹ Gk. (Hom.) *zeiá* 'cereal sp.; spelt', cf. *zei-dōros* 'giving bread', Lith. *jāvas* 'grain sp.', pl. *javai* 'grain (in the field)', Latv. *jāuja* 'threshing barn', ORuss. *ovin* "drying room for grain; threshing barn", Russ. *ovin*.

Another word for 'barley', **ḡh(e)rdh-*, is reconstructed for a more restricted dialect area: Greek-Armenian and Albanian on the one hand, Italic and Germanic (?) on the other:

Gk. (Hom.) *krī* 'barley', *krithē*, pl. *krithai* 'barley (unhulled)', from [**grīdh-*]; Alb. *drithë* 'barley' (see Pisani 1959:118), Arm. *gari* 'barley', from **ḡhri-* (with neutralization of the palatalization opposition in velars before **-r-*, see I.2.3.4). A zero-grade form [**ḡhṛd-*] is reflected in Lat. *hordeum* 'barley' (dial. *fordeum*, from [**dhṛd-*], by dental assimilation).⁷² The Germanic form, OHG *gersta* (Ger. *Gerste*) 'barley', can be derived from the same protoform in full grade, [**ḡherd-*], with a subsequent change of **-rd-* to *-rst-*, possibly due to the influence of the dental suffix.

Strictly speaking, two variant forms of the word for 'barley', formally hard to reconcile, are reflected in the Indo-European dialects: **ḡhṛīdh-* and **ḡh(e)rdh-* (Meillet 1938:398). This may point to independent reshaping of the original form in each dialect group.

These dialect terms for barley, which are evidently later than the Proto-Indo-European term **yewo-* and at first probably referred to some particular variety of barley, displace the older term in a number of dialects: this leads to loss or change of the original meaning 'barley' for **yewo-*: e.g. Gk. *krī*, *krithē* 'barley' beside *zeiá* 'spelt', and other dialect innovations meaning 'barley', 'barley meal', e.g. Hom. *álphiton*.⁷³

71. The Celtic form, like the Hittite form, lacks the initial **y-*. That the Hittite and Celtic forms coincide in the meaning 'barley' increases the likelihood that they are cognate to the forms in **y-* of other dialects. These Celtic and Hittite forms would then show the same absence of initial **y-* that is found in other forms: PIE **yek-* beside Ml̥r. *aig*, gen. *ega* 'ice' (from **yegis*, Pokorny 1959:503) and Hitt. *ekunaš* 'cold'; cf. also Skt. *yamā-* 'twin' beside OIr. *emon* 'twins'.

72. This Latin form can serve as an additional illustration of the rules for the distribution of aspirated and unaspirated allophones of the Indo-European Series II stops in Italic, where the order is aspirated-unaspirated, in contrast to the Greek order unaspirated-aspirated (see I.1.4.2 above).

73. A similar word is found in Albanian, in the form *elp* 'barley'. A cognate is posited for Iranian in the form **arba-*, the source of Old Turkic *arpa* 'barley', with numerous derivatives already in Old Turkic: *arpala-* 'feed barley (to horses)', *arplan-* 'receive barley', and others

4.2.2.2. The earliest range of barley

Barley (*Hordeum* L.) is one of the oldest cultivated grains. It was first domesticated in the Near East and North Africa,⁷⁴ precisely where wild barley (*Hordeum spontaneum*) is found (see Vavilov 1959-1965:V.32-36 [fig. 3], 112, Harlan 1976:92, Lisicyna 1978:102ff.). Traces of barley cultivation are attested in all ancient agricultural cultures of the Near East since the Neolithic revolution (i.e. going back to the tenth millennium B.C.): in Jericho and Beidha, Palestine, of the tenth to eighth millennia B.C. (two-row barley), in ancient western Iran, in Çatal Hüyük of the sixth millennium B.C. (six-row barley without hulls), Helbaek 1964, Semenov 1974:22, 31ff., 44, Renfrew 1969, Haudricourt and Hédin 1943:115-25.

Barley is found in Europe only from the end of the Neolithic, and it becomes a dominant cultivated plant in the Bronze Age (fourth to first millennia B.C.: Clark 1952:108 [1953:115]). In Mycenaean Greece barley was eaten by people and served as winter fodder for cattle (Blavatskaja 1966:76).

4.2.3. Wheat

4.2.3.1. The Indo-European term for wheat

The cultivation of wheat (*Triticum* L.) is as old as that of barley. There are three ancient varieties: diploid (with seven pairs of chromosomes), with a center of domestication in southeastern Turkey, and two tetraploid types (with fourteen pairs of chromosomes), one of which is traced to Palestine and/or southeastern Turkey and the other (*Triticum timopheevi*) to the territory of modern Georgia (Harlan 1976:91, Lisicyna 1978:99ff.). The area where wheat was first domesticated partially coincides with the ancient range of barley.

A Proto-Indo-European stem with the original meaning 'wheat' can be reconstructed as *phūr-: Gk. *pūrós* 'grain of wheat; wheat', Hom. *puroí* 'wheat',⁷⁵ *púrnon* 'bread', cf. Skt. *pūra-* 'type of pastry';⁷⁶ Lith. *pūrai* (pl.) 'winter wheat', Latv. *pūži* id., OPruss. *pure* 'bromegrass' (a weed that grows in

(*Drevnetjurkskij slovar'* 1969:53); cf. Vasmer 1921:16ff.

74. The great number of terms for 'barley' in ancient Egyptian is notable; they evidently denoted different varieties: *it*, *ḥḥ.t*, *šmꜥj*, *šr.t*, *k3m.wt.t* (Erman and Grapow 1955:VI.64). A word for 'barley' is also reconstructed for Proto-Semitic: *šwār-(at-), Fronzaroli 1969:VI.296-97.

75. In Homer, *puroí* 'wheat' is enumerated together with *zeiaí* 'spelt' and *kṛī leukón* 'white barley' as 'grains of the open fields' (*pedíoio euréos*, sg.), Odyssey 4.603-4. In another passage in the Odyssey (9.110), wheat (*puroí*) appears together with *kriḥai* 'barley' and *ámpeloi* 'grapevine'.

76. In Sanskrit the word is preserved only in the figurative sense 'baked from wheat flour'; cf. Gk. *púrnon* 'bread', with the original meaning 'wheat' lost.

grain fields); RChSl. *pyro* 'spelt; millet', Serbo-Cr. *pīr* 'spelt', Slovene *pīr* 'spelt', Russ. *pyrej*; OE *fȳrs* 'couch grass'.

In Germanic and Old Prussian, and partially in Slavic, there is a semantic shift whereby the word comes to denote weeds that grow together with wheat, and the meaning 'wheat' is conveyed by neologisms. In Germanic a new word connected with the white color of wheat appears: Goth. *hvaiteis*, OE *hwæte* (Engl. *wheat*), OHG *weizzi* (Ger. *Weizen*), OIcel. *hveiti*. In Slavic and Old Prussian the new term is a derivative of a verb meaning 'pound', 'grind': OCS *pīšenica*, Russ. *pšenica* beside OPruss. *sompisinis* 'bread made of coarse-ground flour', Skt. *piṣṭām* 'flour', *piṣṭá-* 'pounded'; cf. also Lat. *trīticum* 'wheat' beside *terō* 'pound; mill, grind'.

4.2.3.2. *The original range of wheat. The Proto-Indo-European and Eurasian terms for wheat*

The Near East, where wild species of wheat are found, is usually recognized as the earliest center of wheat cultivation. The Transcaucasus is distinguished by its great variety of wheat species, the result of coexistence of numerous Mediterranean and western Asiatic species and strains since ancient times (Vavilov 1959-1965:III.371-72, V.20-32). This early Near Eastern area was the center from which wheat spread and penetrated into Europe (specifically, into the Balkans from Asia Minor: Timov 1966:26, 27, 36, Renfrew 1969:152, Zohary 1969:59), where traces of several species are found as early as the Neolithic (Clark 1952:108 [1953:115]). The terms for the cultivated plant spread together with the plant itself. This explains the appearance of terms for wheat phonetically similar to PIE **phūr-* in a number of non-Indo-European languages of Central Asia, particularly Turkic and Mongolian: OTurk. *buydaj* 'wheat', Uzb. *bugdoj*, Chuv. *pāri* 'spelt', Class. Mong. *buydaj*, Mong. *buudai* 'wheat'. The word can therefore be regarded as a migratory term which spread to a wide range of languages of the Near East and Central Asia.

4.2.4. *Millet, rye, and oats*

4.2.4.1. *Dialect terms for millet, rye, and oats*

The terms for millet, rye, and oats are dialect words restricted to a narrow dialect area. They must be seen as innovations which arose relatively late after the dialect break-up.

Despite its restricted dialect range, the word for 'millet' is archaic in form and related to the original Indo-European root **mel-* 'grind; grate': Gk. *melínē*

(not found in Homer), Lat. *milium*, Lith. *málnos* (pl.) ‘millet grains’. Millet (*Panicum miliaceum* L.) appears as a cultivated grain in Europe as early as the Neolithic, having entered via Central Asia, the northern Black Sea area, and the Balkans (Semenov 1974:23, cf. Vavilov 1959-1965:V.40-42).

A word for rye, **wrughyo-*, is attested only in the Ancient European dialects: OIcel. *rugr*, OE *ryge* (Engl. *rye*), OHG *rokko* (Ger. *Roggen*); Lith. *rugys*, Latv. *rudzis*, ORuss. *r”ž*, Russ. *rož*’.

4.2.4.2. Cultural-historical information on the spread of rye and oats

Rye (*Secale cereale* L.) makes its appearance as a cultivated grain species significantly later than barley and wheat, appearing in Europe no earlier than the Bronze Age (fourth to first millennia B.C.), and replaces wheat in the more northerly regions of Europe (Semenov 1974:23) by the end of the Bronze Age. This is the period to which the formation of the Ancient European dialect term for rye can be traced. Cultivated species of rye historically arose from weeds which grew with wheat. A trace of this origin of rye is preserved in a number of Asiatic languages whose term for rye is literally ‘plant preying on barley or wheat’ (Vavilov 1959-1965:V.61).

Another species of grain which arose from weeds growing in wheat fields is oats, whose home is also restricted to the Ancient European dialect group: Lat. *auēna*, Lith. *avižà*, Latv. *àuza*, OPruss. *wyse*, ORuss. *ov’s*”, Russ. *oves*. Oats (*Avena* L.) are considered predominantly a European grain, found in cultivated form no earlier than Iron Age settlements (around the middle of the first millennium B.C.), Semenov 1974:23. The Ancient European term for oats can be dated to roughly the same time frame.

4.2.5. Flax and hemp

4.2.5.1. The Indo-European term for flax

An Indo-European term for flax, **līno-*, is represented by etymologically secure forms in Greek, Balto-Slavic, and Latin: Gk. *línon* ‘flax; thread; linen’ (in Homer); Lith. *lināi* (pl.) ‘flax’, Latv. *lini* (pl.), OPruss. *lynno* ‘flax’; OCS *līnĕnŭ* ‘flaxen’, Russ. *len*, Pol. *len*; Lat. *līnum* ‘flax’. Alb. (Geg) *līni*, (Tosk) *liri* ‘flax’, Goth. *lein* ‘linen’, OHG, OE *līn* ‘linen, flax’, and OIr. *lín* ‘flax, net’, Welsh *llin* ‘flax’ are considered loans from Latin; Welsh *lliain* ‘linen’ shows distinctive vocalism (Pokorny 1959:691). However, there are no formal grounds for regarding the Celtic and Germanic forms with their long *ī* as Latin loans, if we admit the inherited nature of the Balto-Slavic forms with their short *ī*. The

claim for Germanic and Celtic borrowing from Latin is based on cultural-historical assumptions rather than on formal linguistic data.

4.2.5.2. *The range of flax; the economic and mythological role of flax among the early Indo-Europeans*

Cultivated flax (*Linum usitatissimum* L.) is attested at a great time depth in Egypt, where the Neolithic settlements Fayum and Badari were already raising flax. Linen fabric is attested beginning with the first dynasties. Flax, formerly considered to be a specifically Mediterranean cultivated plant, is found even in antiquity throughout a much wider range, from Asia Minor to India. It is at least possible that even the strains cultivated in Egypt came from western Asia. By a fairly early date the Egyptian flax species had begun to differ from the western Asiatic ones (Vavilov 1959-1965:V.42-54, Semenov 1974:29).

The method of preparing flax fibers for weaving in ancient Europe coincides with the substantially earlier Egyptian method, which is evidence that the cultivation of flax spread to Europe from the Near East (Clark 1952:232ff. [1953:235ff.]).⁷⁷

From earliest times flax plays an essential role as a material for clothmaking. In early cultures, flax is used much as wool is; later, in cultures where sheep-breeding is less developed, it even displaces wool. The technology of cloth-making and the mythological views earlier connected with wool are transferred to linen as it replaces wool.⁷⁸

Based on its dialect distribution (Greek, Balto-Slavic, Latin, possibly Celtic and Albanian), **li̯no-* 'flax' can be considered an ancient Indo-European formation, reflected in most of the dialects with the meaning 'flax; linen; linen thread'.

4.2.5.3. *The replacement of the term for flax. Migratory terms for hemp*

If we posit a Proto-Indo-European term for flax, then we must posit a loss of this word in a number of ancient Indo-European dialects, specifically in Indo-Iranian, where the original term is replaced by innovations designating flax or a similar plant. The word for hemp (*Cannabis sativa* L.) is obviously such an innovation in Iranian; hemp fiber, like linen fiber, was widely used for cloth-making in certain areas of Central and eastern Asia.

77. Indo-European **li̯no-* 'flax' shows no similarity to any of the many terms for flax in Egyptian.

78. In Homer we find *línon* for the 'thread of life' which is woven and cut off by female deities (Iliad 20.128). Similar notions are linked to flax in Slavic mythology as well: the East Slavic goddess *Mokoš'* is connected with prohibitions against weaving not only wool but also linen on certain days: Ivanov and Toporov 1965:20.

Wild hemp is plentiful in the North Caucasus, the Transcaucasus, Central Asia, the Altai Mountains, and western Siberia. Its cultivation is usually attributed to nomadic cultures (Vavilov 1959-1965:V.81-90). According to Herodotus, prior to the fifth century B.C. hemp (Gk. *kánnabis*) was unknown to the culture of classical antiquity; the Greeks became acquainted with it through the Scythians.

The term for hemp arises as a dialect word (possibly a migratory one) in Indo-Iranian, displacing **līno-* in the meaning 'flax', and spreads to many languages of Eurasia. The term for hemp is especially well attested in Iranian: Khotanese Saka *kumbā*, *kāmbā*, Sogd. *kynp'*, Khwarezmian *knb*, Pers. *kanab*, *kana*, Oss. *gæn/gænx* 'hemp', *kættag* 'linen' (a compound of **kæn-* 'hemp, flax' and *-tag*; Abaev 1958:I.513, 590-91). In Sanskrit and Avestan the ancient word for hemp can be seen in metathesized form in Avest. *ban̥ha-* 'marijuana; hashish', Skt. *bhaṅgā* 'hashish; hemp', see Schrader/Nehring 1917-1923:I.441, 1929:II.645, Mayrhofer 1963:II.461.⁷⁹

Alongside this form another term for hemp, *śanā-*, is attested in Sanskrit; it can be compared with hemp terms with initial velars in Iranian languages. Such doublets in *ś-* and *g-/k-* can easily be explained by positing doublet protoforms with palatalized and unpalatalized initial velars. The *satem* form of this word is probably also reflected in Scytho-Ossetic **san-* 'intoxicating or narcotic beverage; beer' (beside the non-palatalized variant in Oss. *gæn* 'hemp'),⁸⁰ see Mayrhofer 1976:III.292. The same alternations are probably reflected in Scythian *sanáipa* 'drunkards' (*méthusoi*), *sánaptis* 'wine-drinker' (*oinopótēs* . *Skúthai*) beside Scyth. *kannabis* 'hemp' (see Abaev 1949:I.170, 180).

In addition to alternations in the initial velar, the ancient migratory term for

79. The practice of making hashish from wild hemp was evidently common throughout the more southerly parts of Central Asia, where the narcotic properties of the plant increase as one moves south (Vavilov 1959-1965:V.89; see also Semenov 1974:29).

In other Iranian languages the same word, which arises by metathesis (perhaps due to taboo) from the original term for hemp, underlies Sogd. *βγ'ny* 'intoxicating beverage', Khwarezm. *bakanīn* 'beer', Pers. *bagnī* 'beverage made from rice, millet, or barley', Osset. *bægæny/bægæni* 'beer'. The original meaning of all these words must have been 'narcotic prepared from hemp seeds', with further transfers to other intoxicating beverages (Abaev 1958:I.245). The Iranian word is borrowed into Old Turkic: OTurk. *bekni* 'beer, home-brewed beer; alcoholic beverage made from wheat, millet, or barley', cf. *bekmäs* 'grape syrup' (*Drevne-tjurkskij slovar* 1969:92).

80. The connection of the Scytho-Ossetic word for wine, **san-*, with a term originally meaning 'hemp' (cf. Skt. *śanā-* 'hemp') can be explained by the preparation of narcotic drugs from hemp, a widespread practice in Central Asia, where there were luxuriant growths of wild hemp. The semantic shift from 'narcotic, drug' to 'wine, intoxicating beverage' is easily explained by the effect of these substances on the human organism. Significant in this connection are the meanings of Ossetic compounds with *sæn-* in its original sense: *sæntzurdæj* 'in daydream, in delirium', *sæntzyrd* 'speaking senselessly, imprudently', *sæntzoræg* 'speaking senselessly; senseless' (Miller and Frejman 1927-1934:II.1059). When the East Iranian Scythians migrated westward, the term for hashish **san-* was transferred to wine, the major intoxicating beverage in the historical territory of the Ossetic-speaking tribes (cf. OTurk. *bekni*, *bekmäs*: see note 79).

hemp also shows variant stems with and without a final labial: on the one hand, VLat. **canapis*, **cannapus* (reflected in Rum. *cânepă* 'hemp', Ital. *cànapa*), OÍcel. *hampr*, OE *hænep*, OHG *hanaf* (Ger. *Hanf*), Russ. *konoplja*, Pol. *konop*, Bulg. *konop*, Khwarezm. *knb*, Khotanese Saka *kāmbā*, *kuṃbā*, Sogd. *kynp*, Pers. *kanab*; on the other, OHG *hana*, Skt. *śaṇā-*, Pers. *kana*, Oss. *gæn* 'hemp', *sæn* 'wine'.

The term for hemp is a migratory word, as shown not only by the irreconcilable Indo-European dialect forms but also by the existence of this word in a wide range of Eurasian languages: Akkad. *kunib(h)u* 'pea sp.' (?) (see von Soden 1965-1981:I.507), Svan *kan*, Abkhaz *a-konə* 'hemp', Geo. *k'anap-* 'hemp; rope', OTurk. *ken-dir* 'hemp', Kazakh, Turkm. *kenäp* 'hemp', Cheremis *känie* 'hemp'.

The form in its several variants represents an early Indo-European dialectal formation.

4.3. Flora: Shrubs, grasses, and small plants

4.3.1. Heather

4.3.1.1. The Indo-European term for heather

An ancient Indo-European term for heather is reflected by various dialectal derivatives of a root **wer-*. Based on its dialect distribution (Greek, Balto-Slavic, Celtic), the Indo-European term may be considered an ancient formation, going back to an early stage of dialect unity within Indo-European: Gk. *(w)ereikē* 'heather sp.', OIr. *froech*, Welsh *grug* 'heather' (**wroi-kho-*), Lith. *viržės* 'heather', Latv. *viřzis* id.; Russ. *veres*, *veresk* id.

4.3.1.2. The range of heather

The heather family (*Ericaceae*) includes a great many varieties of evergreen shrubs growing in various climatic belts, from the northern arctic to subtropical and mountainous tropical regions. It is impossible to determine which of these species the Indo-European word may have referred to. The existence of the word establishes only the ancient Indo-Europeans' acquaintance with one or more species of evergreen flowering shrubs (see Alekseev et al. 1971:1.94-98).⁸¹

81. This is why it does not seem possible to assume that the Indo-European word referred to one species of heather and infer a proto-homeland from the distribution of that species (cf. Mann 1968:248 and map on p. 226). By historical times the derivatives of **wer-* refer to very different species, as has long been noted in classical philology (studies of the meaning of Gk. *ereikē* have shown that it referred to a species with a thick stalk, quite distinct from the north European species *Calluna vulgaris*).

4.3.2. *Rose, wild rose*4.3.2.1. *The Indo-European term for rose or wild rose*

An alternating form ***wrot’-**, ***wrt’-** is posited as the Indo-European term for ‘rose’. Despite its restriction to Greco-Iranian and Latin, the dialect distribution of the word permits us to regard it as an ancient Indo-European formation: Gk. *wródon* ‘rose’ (cf. in Homer *wrodo-dáktulos* ‘rosy-fingered’, *wrodóeis* ‘rose [sc. oil]’); Avest. *varəða-* ‘rose’, Bartholomae 1904:1369 (cf. Arm. *vard* ‘rose’, Geo. *vard-* ‘rose’), Pers. *gul* (the source of OTurk. *gül* ‘flower; rose’); Lat. *rosa* < ***wrod-ya** (borrowed into various European languages: OHG *rōsa*, Ger. *Rose*, OE *rose*, Engl. *rose*, Cz. *růže*, Pol. *roża* ‘rose’, and others).

The Proto-Indo-European nature of the term is in agreement with its possible etymological connection to the Indo-European root ***wr(ā)t’-/ *wr(o)t’-** ‘branch; root’: Gk. *rhādiks* ‘branch’ (cf. Lat. *rādīx* ‘root’), *rhádamnos*, Aeol. ***wródamnos** ‘shoot’; OIr. *frén* ‘root’ (***wrt’-no-**), Goth. *wairts* ‘root’, OHG *wurz* ‘grass; plant; root’; Oícel. *urt* ‘grass’.

The Indo-European word ***wrot’-/ *wrt’-** ‘rose’ may have referred either to the cultivated plant whose flowers yielded rose oil, or to the wild rose (*Rosa pimpinellifolia*; *Rosa foetida*), a shrublike plant widespread in the Near East, which bears fruit even at altitudes up to 3700 meters (Vavilov 1959-1965:I.204, 343, 352, Berg 1955:225, 228, 257).

4.3.3. *Moss*4.3.3.1. *The Indo-European term for moss*

The Indo-European base ***m(e)us-** and its derivatives form a set of words with the range of meanings ‘moss’, ‘marsh plant’, ‘mold, mildew’:⁸² OE, OHG *mos* ‘moss; swamp’ (Ger. *Moos*), Oícel. *mosi* ‘moss; swamp’; OHG *mios*, OE *mēos* ‘moss’, Oícel. *mýrr*; Lith. *mūsaī* (pl.) ‘mold’; ORuss. *m’x* ‘moss’, Russ. *mox* ‘moss’, Serbo-Cr. *māh* ‘mold’; Lat. *mūscus* ‘moss’; Skt. *musta-* ‘sedge; swamp grass’, Arm. *mamuř* ‘moss’ (with reduplication).

The Indo-European form is attested by clear examples from the Ancient European dialect group, including Latin. A wider dialect base can be posited for the word if Skt. *musta-* and Arm. *mamuř*, which have somewhat distinctive formations, are indeed cognate to the others.

82. Various mosses are found in the northern and forested regions of Eurasia, as well as in the mountainous and alpine zones of more southerly regions.

Chapter Five

Geographical environment and climate. The Indo-European terms for heavenly bodies

5.1. Terminology for geographical and meteorological phenomena

5.1.1. Reconstruction of the geographical environment from linguistic data

The Indo-European terms for plants and animals analyzed above make possible a first approximation to a reconstructed picture of the plant and animal world the ancient Indo-Europeans lived in. Part of these terms cannot be reconstructed for the period of Proto-Indo-European unity, but only for later dialect groupings which resulted from the breakup of Proto-Indo-European. Hence the picture of the ancient Indo-Europeans' plant and animal world is to be thought of as the assembly of flora and fauna known to them, one which changed as speakers of the dialects moved to their later territories.

Similarly, reconstructing the oldest Indo-European terms for geographical and meteorological phenomena makes it possible to reconstruct a partial picture of the geographical environment the ancient Indo-Europeans must have lived in during the time of Proto-Indo-European linguistic unity. This reconstruction yields some terms going back to Proto-Indo-European times and some later innovations which arose in the separate dialect groupings after the breakup of the protolanguage.

5.2. Terms for topographical features

5.2.1. The Indo-European terms for 'mountain'

The Proto-Indo-European word for 'mountain', 'peak' is reconstructed as an alternating base ***Hek'or-** / ***Hk'oe/or-** / ***Hk'or-**:

***Hek'or-**:¹ Hitt. *ḫekur* 'top of cliff or mountain', Skt. *ágra-* 'peak, top; upper edge; beginning' (opposed in the Rígvēda to *budhná-* 'lower; below', *mádhyā-* 'central; in the middle'), Avest. *ayra-* 'peak, top; beginning; first';

1. The phonetic similarity of this Indo-European root in its various ablaut forms to Sumerian *kur* 'mountain', 'mountain country' is notable.

upper', Latv. *agrs* 'early'.

Hk*oe/or-*: Gk. *deirós* 'hill' (Hesychius), *deirás*, Cret. *dērás* 'hill', 'heights', Hom. *boréēs* 'north wind' (from *bóreios* 'montanus', 'mountain (adj.)', Schwyzler 1939:I.461, with *o* vocalism); Thrac. *Huper-boréoi* 'those living on the far side of the mountain; Hyperboreans'; OCS *gora* 'mountain', *gorě* 'top, height', Russ. *gora* 'mountain', Serbo-Cr. *gòra* 'mountain; forest', Bulg. *gora* 'forest', OPruss. *garian* 'tree'.

Hk*or-i-*: Skt. *girí-* 'mountain', Avest. *gairi-* 'mountain', Alb. *gur* 'cliff, rock', Lith. *girià, gìrė* 'forest', Latv. *dziņa* 'forest'.

The semantic shift from 'mountain' to 'forest' to 'tree', shown by the Baltic forms and some of the Slavic ones, is worth note. The Baltic speakers, who ended up in a region without mountains, transferred the original meaning 'mountain' to forests and trees, evidently through an intermediate meaning 'mountain forest'. An analogous semantic shift of 'mountain' to 'forest' is attested in Old Turkic *tay* 'mountain' beside Yakut *təa* 'forest', Lapp *varr* 'mountain; forest' beside Erzja Mordvin *víř* 'forest', Japanese *yama* 'mountain', dial. 'forest' (see Murzaev 1967, Polivanov 1928:32).

The etymological relatedness of Hitt. *ḫekur* 'peak' to Skt. *girí-* 'mountain' is confirmed by the existence of cognate phrases (albeit with some semantic divergence) which reflect phrases going back to Proto-Indo-European: Vedic Skt. *pārvata-* *girí-*, Hitt. *ḫekur Pirwa-*. In the Rigveda, *pārvata-* is used as an attributive to *girí-* to yield the meaning 'mighty (rocky) mountain' — an ancient asyndetic collocation of two nouns with the original meaning 'cliff mountain' (Skt. *pārvata-* 'mountain; rock, cliff'). In Hittite the cognate phrase *ḫekur Pirwa-* must originally have meant 'rocky peak' (possibly deified, see II.4.1.1.5 above): see Imparati 1977. In Vedic, *pārvata-* 'mountain; rock, cliff' also combines, again as an attributive, with another Sanskrit word for 'cliff', *ádri-*: *pārvata- ádri-* 'mighty cliff' (lit. 'mountain cliff'). Comparison of Skt. *ádri-* with the Celtic term for 'cliff, mountain' (Mlr. *ond, onn*) yields the PIE protoform ***ont**'-/****nt**'- with the meaning 'mountain, cliff, rock' (Pokorny 1959:778), which in view of its dialect distribution (Indo-Aryan, Celtic) must be Proto-Indo-European.

The same peripheral dialects reveal another Indo-European stem ***m(e)n-th-** 'mountain, heights': Avest. *mati-* 'foothills', Lat. *mōns*, gen. *montis* 'mountain' (cf. *mentum* 'protuberance; chin'), OBret. *-monid*, Welsh *mynydd*, Corn. *meneth*, Bret. *menez* 'mountain'.²

2. Cf. one of the Egyptian words for 'mountain', *mn.(tj)*, similar to IE ***m(e)n-** (Erman and Grapow 1955:II.69). The same IE root, in the meaning 'rise, stand out' (Pokorny 1959:726), is evidently related to the stem ***mono-** 'neck': Skt. *mānyā* 'neck' (cf. Mitannian Aryan *mani-nni-* 'necklace'), Avest. *manaoθrī-* 'neck', Lat. *monile* 'necklace', OIr. *muinél* 'neck', *for-mnae* 'shoulder' (lit. 'fore-neck'). For the typology of such semantic transfers cf. Georgian *ked-i* 'neck', 'mountain range'. Words for features of the landscape based on body-part terms are discussed in detail below.

5.2.2. *The ancient Indo-Europeans' conception of high mountains*

An essential distinguishing feature of the ancient Indo-European conception of mountains and cliffs is the image of mountains of great height reaching to the sky. This is what must have given rise to the Proto-Indo-European image of 'stone sky'. In Indo-European the very word for 'stone' also means 'sky', conceived of as a stone vault: Skt. *aśman-* 'rock, cliff', 'stone tool, stone hammer', 'thunder god's stone', 'sky'; cf. Avest. *asman-* 'stone; sky'. Traces of such usage are preserved in Greek, where the cognate *ákmōn* 'stone anvil' is also used in reference to the sky: *ákmōn ho ouranós*. In Homer, Zeus suspends 'two anvils' (*ákmonas dúō*, Iliad 15.19), i.e. two huge stones, from Hera's feet as she hangs head down from the sky (see Reichelt 1913). Cognates meaning 'stone' in other Indo-European languages are used of the 'stones' of the thunder god, who throws them down to the earth from the skies: Lith. *Perkūno akmuō* 'stone of Perkunas', Pol. *kamień piorunowy* 'stone of Perun'. The Balto-Slavic mythic image of a thunder god who lives in the sky on a high cliff is a reflex of these same Proto-Indo-European concepts of a sky made of stone and stony cliffs reaching to the sky.

5.2.3. *The connection of mountains and clouds in the perception of the ancient Indo-Europeans*

The image of high mountains is further connected with the ancient Indo-European conception of clouds as mountains (Potebnja 1914:176) and of rain as sent by a mountain deity. In the Rigveda the Proto-Indo-European words meaning 'mountain' and 'cliff', *párvata-*, *girí-*, *ádri-*, also have the meanings 'cloud, storm cloud'. In an Old Latvian rainmaking ritual, prayers are offered to the mountain god Perkons on hills in thick groves (Ivanov and Toporov 1974:9).

The combination of meanings 'mountain' and 'cloud' in one word is explained by properties of the actual topography — high mountains literally reaching to the level of the clouds. A similar polysemy is displayed by PIE **nebh-* 'sky, fog, cloud', which also reflects physical reality — the fact that the sky is often cloudy and foggy. Compare Skt. *nábhah* 'cloud; sky; air, space', Latv. *debess* 'sky, cloud'.

The original polysemy of **nebh-* is transformed in most daughter languages, so that only one of the two meanings is preserved. In some dialects, reflexes of **nebh-* mean 'sky', while other words are used of clouds; in other dialects,

reflexes of ***nebh-** mean 'cloud' while special words for 'sky' are innovated:³

'Sky': Hitt. *nepiš* 'sky' (beside *alpa-* 'cloud'); Avest. *nabah-* 'sky', 'air, space' (beside *awra-* 'cloud; rain'); OCS *nebo*, gen. *nebese* 'sky', Russ. *nebo* id.

'Cloud': Gk. *néphos* 'cloud; fog; mist'; *nephélē* 'storm cloud', 'fog' (beside *ouranós* 'sky'); Lat. *nebula* 'fog, cloud' (beside *caelum* 'sky'), OIr. *nél* 'cloud, fog', OHG *nebul* (Ger. *Nebel*) 'fog', OE *nifol* 'fog, mist' (beside OHG *himil*, Ger. *Himmel* 'sky', OE *heofon*, Engl. *heaven*), Lith. *debesis* 'cloud' (beside *dangūs* 'sky').

The polysemy of words with the range of meanings 'mountain', 'cloud' (and similarly of words meaning 'sky', 'cloud') reflects the physical reality of the ancient Indo-Europeans' topography: the physical fact of clouds building up at peaks of mountains has left its traces in the semantic links found among these words throughout early Indo-European traditions.

5.2.4. 'Mountain' as 'high'

Words with the meaning 'mountain' in the ancient Indo-European languages often combine with attributives derived from ***bh(e)rǵh-** 'high', forming a single lexical phrase. This usage is still well preserved in the Anatolian languages: Hitt. *parku-* 'high' in *parga(m)uš* HUR.SAGMEŠ-*uš* (acc. pl.) 'high mountains', KUB XXXIII 9 Vs. II.7, Luw. *parrai-* 'high' in the collocation *parrayanza* HUR.SAGMEŠ 'high mountains', KUB XXXV 45 II 5 (see Laroche 1963). In the Rigveda the phrase is constructed with a derivative of the same Indo-European root, *bṛh-ánt-* 'high', together with *párvata-* 'mountain': *bṛhatás párvatāt* (abl. sg.) 'from the high mountain', *bṛhatás párvatān* (acc. pl.) 'high mountains', etc.;⁴ Arm. *lerna-berj* 'high as a mountain' (beside *erkna-berj* 'high as the sky').

This archaic usage of ***bherǵh-** in attributive function 'high'⁵ in combination with 'mountain' frequently leads to substantivation of derivatives of this stem

3. Therefore it does not appear possible to reconstruct for ***nebh-** an original meaning 'sky' with a later shift to 'cloud', a reconstruction which has been used to support a claim for the migration of the Indo-Europeans from a continental climate to an area of moderate climate (and the consequent appearance of clouds in the sky; Brandenstein 1952:24ff.). Such a claim is ruled out by the fact that reflexes of ***nebh-** variously carry meanings 'sky' and 'cloud' in closely related dialects spoken in approximately identical climate zones.

4. *Bṛhánt-* as a phrasal component meaning 'high' is used only in phrases having to do with mountains and the sky (frequently in the Rigveda, e.g. *bṛhántam dyām* (acc. sg.) 'high sky').

5. The original grammatical meaning of ***bherǵh-** can be defined as verbal: 'rise', 'stand up, get up', 'be high', as is reflected in a few archaic derivatives, e.g. Vedic *bṛh-*, Toch. A, B *pärk-* 'rise' (also of the sun), Hitt. *parkeš-* 'rise', etc. (see 1.5.5.2 above for the archaic nature of verbal formations expressing a quality or state). Consequently the Proto-Indo-European stem in ***-ntḥ-** from this root (Skt. *bṛhánt-* 'high', Avest. *barəzant-*, etc.) represents an ancient participial formation, cf. Toch. A *-pärkānt* 'rising' (of the sun).

with the specific meaning 'mountain': 'high mountain' > 'high' > 'height' > 'mountain'. Examples include: Avest. *bərəzant-* 'high' (Pers. *buland*), *bərəz-* 'high; height; mountain' (Pers. *burz* 'mountain'), *barəzah-* 'height', *barəšnu-* 'height; high place; sky', Oss. *bərzond* 'high, heights, mountain'; Arm. *-berj* 'height', cf. *barjr* 'high'. Gaul. *Brigantes* (ethnonym), lit. 'mountaineers', OIr. *brí* 'mountain', *Brigit*, female deity (Vendryes 1948:271, de Vries 1961:80). Goth. *baírgahei* 'mountainous area', OIcel. *bjarg*, OHG *berg* 'mountain' (Ger. *Berg*), OE *beorh*, *beorg* 'mountain'; in Germanic these new terms for 'mountain' displace the lost original term.

5.2.5. The term for 'mountain', 'heights'

For Indo-European we can postulate an additional word meaning 'mountain', 'heights, high place', formed from the root **k^hel-*: Hitt. *kalmara-* 'mountain'⁶ (**k^hlⁱ-mor-o-*), Lat. *culmen*, *columen* 'peak, top', *columna* 'column' (**k^hlⁱ-men-*), *collis* 'hill' (**k^hlⁱ-ni-* or **k^hol-ni-*), MIr. *coll* 'head' (**k^hol-n-*), cf. OCS *čelo* 'forehead'; OE *hyll*, Engl. *hill* (**k^hlⁱ-ni-*), OIcel. *holmr* 'small island' (**k^hol-m-*); Lith. *kálnas* 'mountain', Latv. *kalns*; Gk. (Hom.) *kolónē* 'hillock, hill', *kolophón* 'top, peak'. These cognates include words from Hittite, Greek, and the Ancient European language group, which confirms the Proto-Indo-European nature of the derivatives of **k^hel-* 'mountain, high place'.

5.2.6. The elaborateness of the terminology for mountains in Indo-European

We have seen that a number of words referring to mountains, rocky cliffs, and high places can be distinguished in the Proto-Indo-European lexicon. The first is **pher(k^ho)u-* 'mountain', 'mountain oak forest', 'cliff, rock' (see II.4.1.1.4 above), which appears in a fixed collocation with other terms for 'mountain, cliff' as an attributive with the meaning 'high, mighty' (just as the phonetically related **bherǵh-* functions as an attributive in the sense 'big, high'). Another is **Hk'o(e/o)r-*, with reflexes in all the main daughter stocks. **k^hel-* is preserved in the Ancient European languages, Anatolian, and Greek. Finally, **(o)nt'-* and **mⁿth-* are preserved only in languages of the extreme periphery.

Furthermore, we have seen that mountains were conceived of as a stony mass reaching to the skies and having a cloud-covered peak. The natural assumption is that such a lexical subsystem could have developed only in a language spoken in a mountainous area.

6. The meaning 'mountain' is assumed in view of the identity of Hitt. *kalmara-* with the Sumerogram HUR.SAG-*r(i)*, Akkad. *huršānu* 'mountains' (Friedrich 1952:96, Meriggi 1953).

5.3. Terms for bodies of water

5.3.1. Indo-European terms for 'river' and 'stream'

The original Indo-European word for 'river, current, stream' is reconstructed as ***Haph-**, reflected in the main ancient languages: Hitt. *ḫapa-* 'river, stream' (Sumerogram ÍD 'river'); Pal. *ḫapnaš* 'river' (Watkins 1973a); Skt. *āp-* 'river', *āpah* 'waters', Avest. *āfš* 'stream, current', Lat. *amnis* 'stream', OIr. *ab* 'stream' (see I.1.5.8n83 for this set of words and their phonetic correspondence); OPruss. *ape* 'creek', Lith. *ùpė*, Latv. *upe* 'river'.

5.3.2. 'River' as 'fast-flowing'

Indo-European ***Haph-**, a noun of the active class, apparently denoted fast-flowing rivers or streams. Evidence for this is the reconstructed Indo-European phrase ***Haph-os *thekho-** (Avest. *āpō tačinti* 'waters flow', *tači-āp-* 'flowing water', Pal. *ḫapnaš ni tekanza* 'river not flowing', Watkins 1972:112; Latv. *strauja upe tēk* 'fast river flows', cf. *upes tēka* 'riverbed'). In this phrase the Indo-European verb ***thekho-** originally referred to a fast current or rushing stream, as can be seen in the semantics of its historical reflexes such as Vedic *tákti* 'hurries, rushes along' (of rivers, birds, horses, and wild animals), Avest. *tačaiti* 'runs, flows', Oss. *tæxyn* 'fly'; OIr. *techid* 'flees', Lith. *tekù* 'run, flow', Latv. *teku* id., OCS *tekq* 'run', ORuss. *teča* 'racer, fast runner'; cf. Toch. B *cake* 'river'. The reconstructed Indo-European image of a fast-flowing river (***Haph-**) presupposes Indo-European acquaintance with rushing mountain streams.⁷

The notion of a fast river current could also be rendered by the verb ***dhen-** and its derivatives, which subsequently yielded substantivized terms for 'river' and 'spring' in the individual daughter languages: Skt. *dhánvati* 'move fast, rush' (also used of currents in the Rígveda: *adbhís* (instr. pl.) 'in streams'), OPers. *danuvati* 'flows'; Toch. A *tsān-* 'flow'. Nominal forms of this root with the meaning 'river, stream' are represented by Lat. *fōns*, gen. *fontis* 'spring', Avest. *dānu-* 'river', Oss. *don* 'river, water', as well as in many river names of Iranian origin: *Tánaīs* 'Don' (in Herodotus and Strabo), *Dánapris* 'Dniepr', ORuss. *D'něpr*"; *Dánastris* 'Dniestr' (Ammianus Marcellinus), ORuss. *D'něstr*"; *Danoúbios* 'Danube' (Aristotle, Ptolemy, Strabo), see Abaev 1949:I.162, 1958:I.366-67, Trubačev 1968:214.

7. In the Rígveda, mountain rivers are compared with horses breaking away to freedom: *Prá párvānām uśāñ upāsthād āśve iva vīṣite hásamāne* 'Breaking away from the mountains like mares loosed to freedom' (III, 33, 1). This comparison of a swift-flowing river or mountain stream distinguishes Indo-European hydronymy (Porzig 1954:206 [1964:303-4]); cf. e.g. Lith. *Ašvā*, *Ašvijā*, ancient Balkan *Outaspis*, etc.

5.3.3. General terms for water in Indo-European

***Haph-** ‘river, stream’ is opposed in Indo-European to the general term for water, ***wet’-/*ut’-**: Hitt. *witi* (loc.) ‘in water’, *witaz* (abl.) ‘from water’; Skt. *udā́* (pl.) ‘waters, waves’, Gk. *húdei* (dat.) ‘water’, Alb. *újë* ‘water’. This root yields an ancient inactive form in ***-r/n-th-**: Hitt. *watar*, gen. *wetenaš*, Gk. *húdōr*, gen. *húdatos*, etc. (see I.5.1.3 above).

In addition to ***wet’-/*ut’-**, there is another Indo-European root ***ekho-**, also ‘water’, with the derived verbal meaning ‘drink (water)’ and the substantivized meaning ‘water’: Hitt. *watar eku-* ‘drink water’, Toch. A *wār yoktsi* id., Lat. *aqua* ‘water’. In some languages, notably Germanic, this substantivized word for ‘water’ comes to mean ‘river, stream’. Such languages usually lack the original Indo-European word for ‘river’, ***Haph-**, replacing it with *(e)**kho-**: Goth. *ahva* ‘river’, OIcel. *q*, OE *ēa*, OHG *aha* ‘river’, cf. OIcel. *æger* ‘sea god’.

5.3.4. Indo-European terms for ‘sea’, ‘lake’

The Indo-European term for ‘sea’ is represented by different stems in different dialect groups. The clearest example is Hitt. *aruna-* (common gender) ‘sea’ (Sumerogram A.AB.BA), Pal. *aruna-* ‘sea’, which can be compared to Skt. *árṇa-* (neuter), *arṇavá-* (masc.) ‘sea; raging waves’ (see Mayrhofer 1956:I.51).⁸ If Anatolian *aruna-* and Skt. *arṇavá-* are cognate and related to the root ***or-** ‘rise, get up, heave’, then this Indo-European word for ‘sea’ must be regarded as a secondary formation from an originally verbal root. A derivative with this semantics could naturally have referred not only to a sea in the strict sense, but also to any large body of water with waves on the surface, such as large lakes. It is worth noting that Hitt. *aruna-* could mean not only ‘sea’ but also ‘large lake’ (e.g. in the Annals of Mursilis I; Goetze 1933).

This semantic link of ‘sea’ with ‘lake’, etc. is frequently found in other words for ‘sea’ in various Indo-European languages. In the historically attested languages we find formal renewal of terms for ‘sea’ and derivation of new

8. Skt. *arṇavá-* (masc.) also functions attributively to *sam-udrá-* in the same meaning ‘sea’ (lit. ‘aggregate of waters’): *arṇavá-samudrá-* ‘raging sea’. Used with the adjective *mahān*, *arṇavá-* means ‘demon (spirit) of the sea’ (*Mahān Arṇavá-*); cf. Hitt. (*Šalliš*) *Arunaš* ‘Great Ocean’ in an enumeration of gods. Skt. *arṇavá-* must then have been a noun which could function as an attributive to another noun in asyndetic phrases like *arṇavá-samudrá-* ‘raging sea’ (syntactically parallel to *párvata-girí-* ‘mighty mountain’, see 5.2.1 above). This makes the comparison of Skt. *arṇavá-* ‘sea’ to the Hittite noun *aruna-* ‘sea’ more convincing. Both words, Sanskrit and Hittite, may ultimately be derived from the root ***er-/or-/r-** ‘rise, come into motion’, Pokorny 1959:327; cf. Hitt. *ar-* ‘get up’, Skt. *ṛnóti* ‘moves’, *ṛyarti* ‘brings into motion’, used in particular of the sea (*samudráṁ*), e.g. Ved. *samudráḍ ūrmīm úd ṛyarti* ‘from the sea (he) raised a wave’, Rigveda X, 123, 2; Gk. *órnumi* ‘get up, rise up’, Lat. *orior* ‘arise, come up’. Anatolian *aruna-* ‘sea’ may be a deverbal noun in *-wan/-un-* from the same Indo-European root ***or-**: **or-un-o-*.

words for 'sea' from older words which referred to much smaller bodies of standing water such as lakes, ponds, swamps, and the like. This can be seen by comparing words meaning 'sea' in some dialects to their cognates in others which mean 'lake', 'swamp', 'pond', 'water': Gk. *thálassa* 'sea' and Skt. *taṭākam* 'pond'⁹ (Lévy 1972); Lith. *jūra* 'sea', Latv. *jūra* id. (cf. *Jūrmala* 'Riga seacoast', lit. 'seashore'), OPruss. *iūrin* 'sea', OE *ēar* 'sea' and Skt. *vār-*, *vāri* 'water', Avest. *vār-* 'rain', *vairi-* 'lake', Arm. *gayr* 'swamp', Toch. A *wār*, B *war* 'water'.

5.3.5. *Terms for 'sea', 'lake', 'swamp' in Indo-European*

The base **mor-/mar-* produces a set of words which mean 'sea' in a number of Ancient European languages while cognates in other languages mean 'lake', 'bay', 'swamp'; this may be regarded as a lexical isogloss delimiting the Ancient European language group. Ancient European examples: Lat. *mare*, gen. *maris*, OIr. *muir*, Welsh, Corn., Bret. *mor*, Goth. *marei*, OHG *marī*, *merī*, Ger. *Meer*, OCS *morje*, all meaning 'sea'; other languages: Hitt. *marmar(r)a-*, GIš*mammarra-* 'swamp; body of water overgrown with vegetation', Oss. *mal* 'deep standing water, backwater, pool' (Abaev 1965:5-7, 1958-1979:II.69), Arm. *mawr* 'swamp' (see Poetto 1973:177-78). Transitional examples, where the meaning 'sea' coexists with 'lake, swamp', testifying to a semantic shift from 'lake, standing water, swamp' to 'sea', are found in part of the Ancient European languages (all but Italic-Celtic): Goth. *marī-saiws* 'lake' (lit. 'lake sea'), OIcel. *marr* 'sea; lake', OE *mære* 'sea, lake, pond'; Lith. *mārė* 'sea', *mārios* '(Curonian) gulf; sea', Russ. dial. *more* 'lake' (cf. standard 'sea'), Slovene *morské oko* 'small mountain lake' (*oko* 'eye') (Isačenko 1957; cf. Nehring 1959); derivatives in **-škh-*: OE *mēriſc* 'swamp', Engl. *marsh*; MLG *marsch*, Ger. *Marsch* 'marsh'.

5.3.6. *Dialect terms for 'sea'*

Innovations meaning 'sea' in a number of languages are connected with an earlier meaning 'ford'. This semantic shift, like that of 'swamp, standing water' to 'sea', is a plausible one where there are large bodies of water, shallow near the shore, with bays or inlets which can be forded. Examples: OE *wæd* 'sea, water' beside *wadan* 'wade', OHG *watan* 'wade, ford', Lat. *uadum* 'ford', etc. (Porzig 1964:173); Oss. *fūrd/ford* 'large river, sea' (cf. Scythian *Pórata*, the

9. For the correspondence of Indic cerebrals to **l* elsewhere in Indo-European, see Thumb and Hauschild 1958:I.1.104, 241-42.

name of the river Prut, according to Herodotus: Abaev 1949:I.177) beside Avest. *pərətu-* 'crossing, ford, bridge', Lat. *portus* 'harbor', cf. *angiportus* 'narrow passage', Gaul. *ritu-* 'ford', OHG *furt* 'ford' (Ger. *Furt*), OE, Engl. *ford*, OIcel. *fjörðr* 'fjord, small ocean bay'.

These lexical innovations for 'sea' based on early Indo-European words for 'swamp, standing water, pond', etc. can be explained by a change in the environment inhabited by the speakers of these languages, who lost the original word for 'sea' in the sense of 'heaving surf, raging watery element' and devised names for new seas met in the course of their migrations by drawing on different semantic features. In some languages the sea is named for its smooth surface: Gk. *pélagos* 'sea' (derived from **p̥hel-* 'smooth, even', cf. Gk. *pláks* 'a plain, flat area', Pokorny 1959:831-32), Lat. *aequor* 'mirror-like surface of water, smooth surface of sea'.

5.3.7. 'Sea' as 'salty'

Together with the Indo-European term for 'sea' or 'large lake' conceived of as a raging, heaving watery element, we find another term for 'sea' or 'large lake' based on its salty water, a term opposed to those for all fresh-water bodies.¹⁰ This term shares its root with the Indo-European word for salt **sal-* (common gender for 'sea', neuter gender for 'salt'): Skt. *sal-ilá-* 'sea' (etymologically 'salty': Thieme 1953:20, 27ff.); Myc. Gk. *a₂-ro* (PY Ta 642) = **halos* 'sea', Camera 1981; Hom. *háls* (fem.), gen. *halós* 'sea, seawater' (cf. *háls*, masc., 'salt'), *hálíos* 'sea' (adj.), *ein-álios* id., *halieús* 'sailor, fisherman', *hálme* 'seawater, saltiness'. Lat. *sāl* (masc.), gen. *sālis* 'sea, seawater' (cf. *sāl*, masc. and neut., 'salt'), *salum* 'sea', *īnsula* 'island' (lit. '(that which is) in the sea', *hē en halī oūsa*, cf. Gk. *en-álios* '(that which is) in the sea', Pokorny 1959:878); Welsh *heli* 'sea'; OCS *slanŭ* 'seawater', ORuss. *slan'nik* 'sea fisherman' (cf. Hom. Gk. *halieús* 'fisherman, sailor', above); Norw. *sylt* 'flooded seacoast'.

The equation of 'sea' and 'salt' is found in Greek-Aryan, Italic-Celtic, and Slavic, which gives dialect-geographical evidence for the Proto-Indo-European status of **sal-* 'sea'.¹¹

10. A typological parallel is the meaning 'sea' and 'large river' in Arabic *baħr-*; the meanings are distinguished by specification as salty or fresh (see Bartol'd 1925). The same two meanings 'sea' and 'large river' are united in Skt. *sīndhu-* and Pers. *daryā* (see Abaev 1958:I.486).

11. In addition to oceans and seas, 'salty' can also be applied to certain lakes, rivers, and springs, evidently those whose waters contain mineral salts. This may be the source of the river name (Gk.) Halys (in Asia Minor, modern Kızıl-Irmak), the Celtic-Illyrian hydronyms *Sala* (Ger. *Saale*), Illyr. *Sal-ap-ia*, and numerous Slavic names such as ORuss. *Sol'* *Galič'skaja* (lit. 'salt of Halyč'), cf. Serbo-Cr. *slätina* 'mineral spring' (Vasmer 1953-II.689 [1964-1973:III.714-15]).

5.3.8. *Seafaring terminology among the ancient Indo-Europeans*

The ancient Indo-Europeans were acquainted with a sea or large lake and navigable rivers, as is attested by the existence of specialized terms for ‘boat, ship’, PIE ***naHw-**, and ‘float, sail’ (of boats, ships), ***phleu-**. Examples for ***naHw-**: Skt. *nāu-* ‘ship, boat’, *nāvyá-*, Avest. *nāvaya-* ‘navigable’ (of rivers), OPers. *nāviyā-* ‘navigable’; Hom. Gk. *nēūs*, gen. *nēós* < **nāwós* ‘ship’, Attic *naūs*, gen. *neōs*; Lat. *nāuis* ‘ship’, OIr. *náu* ‘ship, vessel’, OIcel. *nór* ‘boat’, OE *nōwend* ‘seafarer’. Movement by boat in a large body of water is expressed by PIE ***phleu-**,¹² which forms derivatives meaning ‘boat, ship, vessel’: Gk. *plōiōn* ‘ship’, OIcel. *fley* id. (cf. OE *flota* id.), Toch. B *plewe* ‘ship’; Skt. *plavá-* ‘boat’, Russ. *plov* ‘boat, dugout’ (cf. ORuss. *plov’c* ‘navigator, seafarer’).

An Indo-European term for navigation with oars is preserved in the historical languages in the form of Ved. Skt. *aritra-* ‘oar’, *arítár-* ‘rower’, Hom. Gk. *erētēs* ‘oars’, *eretmón* ‘oar’, *eréssō* ‘row’ (cf. Gk. *haliēreōs* ‘rowing by sea’), Lat. *rēmūs* ‘oar’, OIr. *rá-* ‘row’, *imb-rá-* ‘row, travel by ship’, *rāmae* ‘oar’, OIcel. *róa*, OE *rōwan* (Engl. *row*), OHG *ruodar* (Ger. *Ruder*), OE *rōðor* ‘oar’, Lith. *iriù* ‘row’, *irklas* ‘oar’, OPruß. *artwes* ‘travel by ship’: PIE ***erH-**/***reH-**.

5.3.9. *The ancient Indo-European concept of the sea. The sea in Indo-European myth*

The presence of more than one term for ‘sea’ in various Indo-European languages (e.g. Gk. *thálassa* and *pélagos*, Sanskrit *salilá-*, *arṇavá-*, *samudrá-*, *síndhu-*) shows that we can posit for Indo-European, as for the daughter languages, several different terms for ‘sea’ or ‘large lake’, each based on a different property — ‘salty’, ‘raging’, etc. The existence of Proto-Indo-European words for ‘sea’ shows that the ancient Indo-Europeans were acquainted with a sea or large bodies of water such as large lakes and navigable rivers. In the ancient tradition, ‘sea’, ‘large lake’, and ‘large river’, all of which refer to broad expanses of water, were a single notion, and only the epithet ‘salty’ distinguished the sea from fresh-water lakes and rivers.

In an ancient Indo-European myth of the deity of waters or expanses of water (Skt. *Apám Nápāt*, Avest. *Apqm Napāt-*, Celtic *Nechtan*, Lat. *Neptūnus*), reconstructed on the evidence of shared Indo-Iranian and Italic-Celtic mythic sources, there appears a mythic body of water, a large lake, sea, or spring (Vedic *samudrá-* ‘sea’, ‘collectivity of waters’, Avest. *vairi-* ‘lake’, OIr. *topur*

12. Cf. Skt. *plávate* ‘floats, sails’, Hom. Gk. *plé(w)ō* ‘float, sail’ (by sea), *plóos* ‘movement of a boat’, Lat. *perplouēre* ‘let flow’, RChSl. *plavitisja* ‘travel by sea’.

'spring', Lat. *lacus* 'lake; spring') which is the source of all rivers that flow to the sea. The Proto-Indo-European myth is reconstructed as a sequence of episodes whose fundamental traits are alike in each daughter tradition: a water deity guards a lake or spring (in the Roman tradition, *lacus Albanus*, the Alban Lake, or a mountain lake) in which there is a blinding light (Avest. *xvarənah-* 'glory, majesty [emanating from sovereign power]'; in Celtic myth a blinding gleam of the eyes);¹³ as the result of an attempt to steal the blinding fire, the water flows out of the lake onto the earth; thus are created the world's rivers, which flow to the sea or return to the lake which is their source (Dumézil 1973:21-89). This reconstructed myth of a (mountain) lake as spring or source of rivers continues an ancient conception of the unity of all waters, linked in a single circulating flow. According to the myth, there is particular danger when water flows out from the source lake or spring, and this can be averted with a special ritual.¹⁴ The details of the myth show that the mythic lake can be interpreted as a spring-fed mountain lake.

The water god who guards the source of waters turns into a god specifically of the seas in some daughter traditions, e.g. the Roman one: cf. Varro's (5.72) female hypostasis of Neptune, *Salacia Neptūni*, derived from *salum* 'sea'.

In summary, the reconstructed Proto-Indo-European words for 'sea', based on the notion 'raging, stormy' as well as on the feature of saltiness, could refer not only to a sea in the strict sense but also to large bodies of water such as salty lakes. The linguistic reconstruction cannot tell us whether the ancient Indo-Europeans distinguished seas from other bodies of water such as large salty lakes; a salty lake could have been regarded as a sea, or vice versa.

13. Indo-European words for 'spring' are formed from 'eye': Hitt. *šakuni-* 'spring' (beside *šakuwa* 'eyes'), OPol. *okno* 'spring', Serbo-Cr. *ōko* 'eye; deep place in water with a spring at the bottom' (Tolstoj 1969:207-10), Russ. *oko* 'eye', etc.; Lith. *vandėns akis*, lit. 'eye of water'. In ancient Germanic myth, the spring Mimir, located beneath the Cosmic Tree, is where Odin left his eye in pledge. A typological parallel is the equation of eyes with springs in Semitic: Arab. *ʿayn* 'eye; spring', Akkad. *īnu* 'eye; spring'.

Another Indo-European term for 'spring' is related to the general term for water, **wot'-or-/enth-*: Hitt. *wataru-* 'spring', Skt. *avatā-* 'well', Latv. *avuotis* 'spring', cf. Lith. *Avantā* (river name), Gaul. *Aventia* 'spring nymph'. The dialect geography of the term shows that the original meaning 'spring' and its link to **wot'-* 'water' are Proto-Indo-European. The lack of voicing in the reflexes of **t* in Indic, Baltic, and Celtic, and the spelling of the reflex as *-tt-* in Hittite, are notable. This word is an example of the relic forms in a number of Indo-European languages where reflexes of Indo-European glottalized consonants are not voiced.

14. There is a partly analogous Hittite ritual for preventing changes in the course of the river *Maraššanta-* (the Halys, the modern Kızıl-Irmak). The text of the ritual contains a brief reference to a myth according to which 'formerly the river Marassanta flowed in a different bed; but the Thunder God turned it and made it flow toward the Sun God, God of Gods': *ḪMa-ra-aš-ša-an-ta-aš-wa an-na-al-la-za ʿi-pa-at-tar-ma-ya-an a-ar-ša-aš ʰU-aš-ma-wa-ra-an wa-aḫ-nu-ut nu-wa-ra-an ʰUTU-i DINGIRLIM-an ar-ša-nu-ut*, KUB XXXVI 89 Rs. 12-14. Earlier in the text there is a reference to the 'bed of nine seas' (*a-ru-na-aš-ša-aš IX-aš wa-ap-pu*, ibid. Rs. 4) and 'the bed of the great (lit. 'revered') river' (*na-ak-kji-ya-ša-aš ʱD-aš wa-ap-pu*, ibid. Rs. 5).

5.4. Meteorological phenomena: wind, storm, rain, snow, etc.

5.4.1. Indo-European terms for 'wind' and 'storm'

Wind and storms are designated in Indo-European by various derivatives of the root ***Hw-** 'blow' (Skt. *vāti* 'blows', Avest. *vāiti*, Gk. *áēsi* 'blows', Goth. *waian* 'blow', OHG *wāen*, Ger. *wehen*, OCS *vějati* 'blow'): Hitt. *ḫuwant-* 'wind', Toch. A *want*, *wānt*, B *yente* 'wind', Lat. *uentus* id., Welsh *gwynt* id., Goth. *winds* id., OE, Engl. *wind*, OHG *wint*, Ger. *Wind*: PIE ***Hwenth-**. Other daughter languages show derivatives of the same root with different suffixes: Skt. *vātaḥ* 'wind; wind god', Avest. *vāta-* 'wind'; OCS *větrŭ* id., OPruss. *wetro* id., Lith. *vėtra* 'storm' (cf. derivatives in ***-dhr-** such as OE *weder* 'weather, storm, wind', Engl. *weather*); Gk. *áella* 'storm, whirlwind' (*áellai kheimériaí* 'winter storms'), Mlr. *aial*, *ahél* 'breeze', Welsh *awel*, OCorn. *auhel* 'breeze' (for the *-l-* suffix, cf. OCS *větrilo* 'wind' and forms meaning 'cloud, fog' such as Gk. *nephélē*, Lat. *nebula*, OHG *nebul*, based on ***nebh-** 'sky': Hitt. *nepiš*, OCS *nebo* 'sky', etc.: Porzig 1954:189-90 [1964:280-81]). There are also nominal derivatives of the same root: Skt. *vāyúḥ* 'wind, air, wind god', Avest. *vāyuš* 'wind, air', Lith. *vėjas*, Latv. *vējš* 'wind'.

5.4.2. Wind and storm in Indo-European mythology

Wind and storms play a central role in ancient Indo-European conceptions. It is safe to claim that the notions of wind and storm had undergone incipient deification by earliest Indo-European times. It is no accident that we find derivatives in ***-nth-**, a marker of active-class nouns (see I.5.5.4 above).

The concordant evidence for the mythic connections of wind in various historical Indo-European traditions must reflect the earliest Proto-Indo-European mythic conceptions. In the Indo-Iranian mythic tradition a pair consisting of the wind god and the thunder god (in the dual: Skt. *Índra-Vāyū-* 'Indra and Wind', *Vātāparjanyaś* 'Wind God and Thunder God') heads the pantheon and is considered ancestral to an entire generation of gods and mythic heroes (Dumézil 1968:47ff.; Wikander 1941). A mythological image of the wind as a giant is reflected in individual Iranian traditions to the present day, e.g. Oss. *wæjug* < **vayu-ka* 'giant', Abaev 1965:111-15. A special relationship to the gods also characterizes Aeolus (*Aíolos*) in Homeric Greek mythology. He is presented as a 'friend of the immortal gods', *phílos athanátoisi theôisin* (Odyssey 10.2), and has the gift of being able to call out or quiet the winds.

In Homer and in the Mycenaean period, 'wind' and 'deified wind' are rendered by *ánemos* (Myc. Gk. *a-ne-mo i-je-re-ja* 'holy wind', see Morpurgo

1963), a form linked to the Indo-European word for 'breath': Skt. *ánila-h* 'breath', OIr. *anál* id., Lat. *anima* 'breath, soul', OIcel. *andi* 'breath, soul' (see II.1.1.2 above), in opposition to Gk. *áella*, derived from *Hw-, which has the specific meaning 'storm'. The etymological connection of Gk. *ánemos* 'wind' with the Indo-European word meaning 'breathe, breath' points to a conception of wind as the breath of a god. This is reflected in later Greek tradition up to Aristophanes: in 'The Birds' *hupénémion* is a term for the egg of the world, fertilized by a divine wind (Morenz 1950). This view of wind is particularly characteristic of Slavic myth and folklore, where wind is defined as the breath of gods: there is an East Slavic proverb *Veter — dux božij* 'wind is God's breath', also found in *Golubinaja kniga* (see Afanas'ev 1865:I.285ff.). The same conception of wind as the breath of the god Varuna is characteristic of Vedic mythology.

5.4.3. The four winds

Certain Indo-European traditions, notably ancient Greek and Slavic, deified the winds from the four directions of the compass. This system is reflected in Homer, who distinguishes the 'cold north wind' *Boréēs*, the west wind *Zéphuros* (which brings rain and snow, Odyssey 19.206), the 'wet south wind' *Nótos*, and the warm stormy east wind *Eúros*. The north wind *Boréēs* has particular significance for a reconstruction of the earliest Indo-European conceptions about winds. This term is etymologically related to the Indo-European word for 'mountain', *Hk'o-or- (see 5.2.1 above). *Boréēs* must therefore have originally been thought of as a mountain wind which blew from the north. The Greeks' conception of mountains in the north evidently arose before their arrival in their historical homeland. It is no accident that these winds are thought of as blowing in a 'legendary country', which must be the former homeland, preserved in folk memory. Particularly revealing in this connection is evidence from the Slavic tradition, where the name of the north wind is also etymologically related to PIE *Hk'o-or- 'mountain': East Slavic *Gora*, *Goryč* (Murzaev 1967). The formal identity of these Slavic and Greek designations of the north wind as 'mountain wind' permits us to locate the Indo-European tribes in a region with mountains to the north of it, at a period of relatively early dialect unity.

Also worthy of attention is the conception of the four winds as mythological 'brother beings' in Slavic and Germanic tales (Afanas'ev 1865:I.313-17), in which we can see a trace of the ancient conception of deified winds blowing from the four compass directions. In Old Indic myth the four winds are deified not as special gods but as the breath of the four highest gods. This may reflect a regularization of the Old Indic pantheon whereby the basic deities are preserved

and secondary, formerly independent, deities become their attributes.¹⁵ For example, the embodiment of the west wind and the west in general in Old Indic myth is the god Varuna, who has a number of other functions as well. A trace of the earlier system can be seen in the Greek, Slavic, and Germanic traditions, where the wind gods are for the most part monofunctional, representing the embodiment of the winds and nothing else.

5.4.4. *The Indo-European term for rain*

The Proto-Indo-European term for rain is properly a verb denoting rain-making, reconstructed as a base **seu-/*su-* with the original meaning 'squeeze out, press out' (see II.4.2.1.7 above). Rainmaking is thus thought of as the squeezing out or pressing out of rain by an agent deity: Gk. *húei* 'it rains', Alb. *shi* 'rain', OPruss. *suje* (written *suge*) 'rain', Toch. A *swā-, su-*, B *swā-, swās-* 'pour (of rain)', A *swase*, B *swese* 'rain'. The dialect distribution of these words (Greek-Albanian-Baltic and Tocharian) shows that **seu-/*su-* in the sense 'rain' is very ancient, going back to the period of early dialect unity.

5.4.5. *Rain as the manifestation of a god's power. Taboo replacement of the term for rain*

A god is the agent of rain in the ancient Indo-European view, as is clear from the specialized usage of the verb **seu-/*su-* in syntagmatic combination with the name of the supreme deity, e.g. in Homer *hūē d'ára Zeús* 'and Zeus sent rain' (Iliad 12.25; Odyssey 14.457). Subsequently this active construction becomes impersonal and *húei* comes to mean 'it rains' in Greek.

That rain was sent by the supreme deity, and that the rain he sent was crucial to agriculture, may have provided grounds for taboo replacement of the original sacral term by other lexical formations. This is the explanation for the low number of attested Indo-European languages preserving **seu-/*su-* in the sense 'rain'. The ancient root is preserved in its original sense only in Greek, Albanian, Old Prussian, and Tocharian. In all other branches it is replaced by other words. In Hittite we find *ḫeuš*, pl. *ḫeyaweš* 'rain', a noun which functioned as either subject or object (e.g. *ḫe-i-ú-un ú-e-ik-ta* '(he) asked for rain', KBo III 7 II 25). The Hittite word is evidently a loan from Egyptian which

15. We can see an analogous regularization of the pantheon in the Hittite mythological system where the winds function as attributes of gods, making possible their rapid transportation in space. In Hittite rituals for calling out the gods we find 'winds from the four directions' (KUB XXXVI 90, 39-40), although this terminology may reflect the influence of the Mesopotamian custom of designating the four directions by their winds, see Haas 1970:182-83.

replaced the original Indo-European word for rain: cf. Egypt. *ḥwj*, Copt. *hōw* 'it rains'. In Sanskrit the meaning 'it rains' is rendered by *várṣati*, which reflects IE **wers-* 'pour, spill' (which also gives Gk. *érsē*, *eérsē* 'dew'). In Latin the original word is replaced by the neologism *pluit* 'it rains' (impersonal), from the Indo-European verbal base **phleu-* 'float, swim; soak, make wet'. In Germanic the ancient word is replaced by an innovation based on IE **rek̑-* 'make wet, irrigate' (cf. Lat. *irrigāre* 'water, irrigate', *rigāre* 'plumb, bring water'): Goth. *rign*, OIcel. *regn*, OHG *regan* (Ger. *Regen*), OE *reg(e)n*, *rēn*, Engl. *rain*. In Slavic the original word is replaced by the descriptive expression **dŭždŭ* (OCS *dŭždŭ*, Russ. *dožd'*, Pol. *deszcz*) from **dus-dyu-* 'bad day' (this formation is discussed below).

5.4.6. Rainmaking rituals

The taboo on the original term for rain was evidently due to the ritual significance of rain in the Proto-Indo-European period, reflected in rainmaking rituals preserved in ancient texts. In Hittite rituals an appeal is made to the thunder god, the supreme deity, to send down rains (KUB XXIX 1 I 27). KBo III 7 II 21-25 describes a sacrificial ritual asking for rain. In Baltic and Slavic rituals an important role is played by rainmaking rites, preserved to the present day in several Slavic traditions; girls who take part in these rituals are given names related to that of the thunder god Perun (Jakobson 1970; Ivanov and Toporov 1974:104ff.).

The evidence of all these ancient traditions reflected in rainmaking rituals agrees with the Homeric formula mentioned above, *hūe d'ára Zeús* 'and Zeus sent rain'. All of them reflect a Proto-Indo-European conception of rain as sent down by the supreme deity, the god of thunder and lightning, from whom people solicit rain. This would seem to point to periodic dry spells during which rains were infrequent and regarded as a gift of heaven that had to be requested of a god.

5.4.7. The Indo-European term for snow

The Indo-European term for snow, **sneigho-*, is better attested in the various branches: Avest. *snaēžāt* 'snow will fall', Hom. Gk. *niphás* 'snow', *niphémen* 'fall' (of snow), Gk. *neíphei* 'it snows', Lith. *sniēgas* 'snow', *sniēga* 'snow falls', OPruss. *snaygis* 'snow', OCS *sněgŭ* 'snow', Russ. *sneg* 'snow', *snežit* 'snow falls', Goth. *snaiws* 'snow', OIcel. *snjór* 'snow', OHG *snēo* (Ger. *Schnee*), OE *snāw*, Engl. *snow*, Lat. *nix*, gen. *niuis* 'snow', *ninguit* 'snow falls', OIr. *snechtae* 'snow'. The dialect distribution (Iranian, Greek, Balto-Slavic, Germanic, Italic-

Celtic) shows that the word is Proto-Indo-European. The apparent absence of the word from Hittite and Tocharian is simply due to its non-attestation in texts.

In other branches there is replacement of the original Indo-European word by other lexical formations, primarily derivatives of **ǵheim-* 'winter': Skt. *himá-* (masc.) 'cold, freeze, snow', *himávant-* 'snow-covered' (Ved. *himávantas párvatās* 'snowy mountains', the source of the term *Himalayas*) beside *héman*, *hemantá-* 'winter'; Wakhi (Pamir Iranian) *zəm* 'snow' (Paxalina 1975:306). The same use of a derivative of 'winter' to mean 'snow' can be seen in Greek, where the original word for 'snow' is also preserved: Gk. *khíōn* 'snow' beside *niphás* 'snow' and *kheîma*, *kheimōn* 'winter'. This lexical innovation, found in Greek, Indic, and Pamir Iranian, can be considered an ancient Greek-Indo-Iranian isogloss. However, while in Greek the ancient Indo-European word *niphás* 'snow' is preserved alongside the dialectal innovation *khíōn* 'snow', in Indic the verb *snih-* undergoes a semantic shift from 'snow falls' to 'be wet, soft', cf. the participle *snigdhá-* 'soft'. Celtic shows an analogous semantic change in the original Indo-European verb 'snow': OIr. *snigid* 'rain falls, drips' beside nominal functions retaining the original meaning 'snow': OIr. *snechtae*, Welsh *nyf*.

5.4.8. Terms for cold and ice in Indo-European

'Cold' and 'ice' belong to the same semantic field as 'snow' in Indo-European. Lexemes with this meaning can be reconstructed in the form of several ancient roots displaying complementary dialect distributions (but partially overlapping in Germanic).

PIE **(y)ek-* 'cold, ice': Hitt. *ega-*, *egan* 'ice' (see Hoffner 1971), *ekuna-* 'cold, frozen', *ekunima-* 'cold, freeze' (*e-ku-ni* IM-*an-ti* 'to the cold wind', KUB VIII 35 II 11, 14; *i-ku-na-an* UZU^{IA} 'frozen fat', KBo IV 9 V 47, see Goetze 1929:186), cognate to Mlr. *aig* 'ice', gen. *ega*, Welsh *iâ*, OCor. *jei* 'ice', MCor. *yeyn*, *yen* 'cold', Bret. *ien*; OIcel. *jaki* 'piece of ice', *jökull* 'icicle'; the dialect distribution (Hittite, Celtic, Germanic) indicates a Proto-Indo-European root.

Another word with the same meaning can be reconstructed on the strength of Germanic and Iranian cognates; the dialect distribution points to an early chronological stage: OHG *īs* 'ice, glacier' (Ger. *Eis* 'ice'), OE *īs* (Engl. *ice*); Avest. *aēxa-* 'ice, freezing temperature', *isu-* 'icy, freezing', Sogd. *yyδyn* 'glacier' (from **yēxoδan*, Gauthiot 1914-1923:98), *ynyyn'k-* 'icy' (Andreev and Peščereva 1957:365), Pashto *yaxní* 'cold, freezing temperature', Shugni (Pamir Iranian) *ayd* 'frozen', *iš* 'cold' (Sokolova 1967:87), Wakhi *(y)iš* 'ice' (Paxalina 1975:301, Grjunberg and Steblin-Kamenskij 1976:510). The Indo-European root is reconstructed as **eis-/is-*, with alternating full and zero grades.

Greater dialectal restriction is displayed by another word with the specific meaning 'cold, hard freeze' found in the Greek-Italic dialect group; the dialect geography points to a relatively ancient stage: Hom. Gk. *rhîgos* 'cold, chill', *rhigóō* 'shiver' beside Lat. *frīgus* 'cold, hard freeze', pl. 'hard freeze in winter; winter', *frīgidus* 'cold, chilly; having a cold climate', *frīgeō* 'be cold'. An Indo-European dialectal protoform **sr̥ik-* can be reconstructed, with individual developments of initial **sr-* in Greek and Latin.

A special dialect word 'ice, cold' is found in Tocharian: Toch. A *kuraś* (*krośś-*) 'cold', B *krost-*, *krośś-*, A *krośśune* 'cold, ice', Gk. *krústallos* 'ice, glass, crystal; anything frozen', Hom. *krúos* 'freezing temperature, hard freeze', *krūmós* 'cold, hard freeze, freezing temperature'. To judge from its dialectal distribution, the word is fairly old, going back to an early dialect area in Indo-European.

Another word meaning 'freeze, cold' may have been **phreu-so-*, reflected in a number of dialects: Lat. *pruīna* 'frost, drizzle', OIcel. *frjósa* 'freeze', OE *frēosan* (Engl. *freeze*), *forst* (Engl. *frost*), OHG *frīosan* 'freeze', Welsh *rhew* 'freezing temperature'; possibly also Skt. *pruṣvā* 'frost (?)', see Hamp 1973, Gerow 1973.

It is interesting that so many words for 'ice' and 'cold' can be reconstructed for Indo-European; this is consistent with a mountainous homeland for the Indo-European-speaking tribes.

5.4.9. Indo-European terms for warmth and heat

Together with 'cold, ice' we can also reconstruct Indo-European words meaning 'warmth, heat'. The most important is **ghoer-m-*, attested by the following correspondences: Ved. Skt. *gharmá-* 'heat, warmth', Avest. *garəma-* 'hot', Arm. *Jerm* 'hot', Hom. Gk. *thermós* 'hot', Alb. *zjarr* 'fire', OPruss. *gorme* 'heat', Lat. *formus* 'hot', Toch. A *śärme* 'summer heat' (Van Windekens 1969:477). Forms without the **-m-* suffix: Skt. *hāras-* 'blaze, heat (of fire)', Arm. *Jer* 'warmth', Hom. Gk. *théros* 'summer', OIr. *gorim* 'make hot' (Ir. *gor* 'heat'), OPruss. *garrewingi* 'lustful, ardent', OCS *gorěti* 'burn', Russ. *goret'*, Russ. *žar* 'heat', Czech *žár*, Serbo-Cr. *žár*.

Another Proto-Indo-European root for 'heat, warmth' is **theph-*: Skt. *tāpaḥ* 'heat, warmth, blaze', Avest. *tāpaiti* 'is warm', cf. Sogd. *tph* 'fever', Wakhi *tab* 'hot place, hot air; fever', Lat. *tepidus* 'warm', *tepeō* 'I am warm', *tepor* 'warmth'; OIr. *té* 'hot', MÍr. *timme* 'heat', Welsh *twym* 'hot'; OPruss. *Taplawken* 'Warm' (toponym), cf. *Teplitz*; OCS *toplŭ* 'warm'; cf. OE *þeġfian* 'pant, be agitated'. The same root is attested in Anatolian in the meaning 'heat, hot place; fever': Hitt. *tapišša-*, Luw. *tapašša-* 'fever', *tapašuwant-* 'in a fever' (Laroche 1959a:92). Some scholars consider the word a loan from Skt. *tāpaḥ*

(Friedrich 1952:211). However, the Vedic meaning of *tápaḥ* ‘heat, hot place; blaze’ is farther removed from the Hittite-Luwian meaning than are those of the Iranian cognates (‘heat, hot place; fever’). If we are to posit a borrowing of this word into Anatolian from Indo-Iranian (as is supported by the *a* vocalism in Anatolian *tapaš-* instead of the expected *e*, and also the spelling with single *-p-*), then it must have been into Proto-Anatolian rather than into the separate Anatolian languages.

In Hittite itself the old word meaning ‘hot, warm’ appears in the form *wantemma-*, with a suffixal element **-mo-* often found in derivatives from various roots in this semantic field: e.g. PIE **ghoer-mo-* ‘hot’, Mlr. *timme*, Welsh *twym* ‘heat’, and Goth. *warmjan* ‘make warm’, OHG *warm*, Ger., Engl. *warm* (from PIE **wer-* ‘burn’: Hitt. *war-* ‘burn’, *war-nu-* ‘burn’ (trans.), Arm. *vařem* ‘set on fire’, cf. OCS *varŭ* ‘heat’, *variti* ‘boil, cook’); Hitt. *ekunima-* ‘cold’, Gk. *krŭmós* id., etc.

5.5. Astronomical phenomena: sun, moon, stars, constellations

5.5.1. The Indo-European term for ‘sun’

‘Sun’ is reconstructed for Proto-Indo-European as **s(a)wHel-/n-*, with traces of heteroclitic inflection (Benveniste 1935:12): Ved. Skt. *súvar-*, gen. *súrah* (neut.) ‘sun, light, sky, luster’, *súryaḥ* ‘sun, sun god’,¹⁶ *svárṇa-* ‘light-bearing’, Avest. *hvar-*, gen. sg. *xvāng* ‘sun, sunlight’, Hom. Gk. *ēēlios*, Cret. dial. *awēlios*, Lith. *sáulė* ‘sun’, OPruss. *saule*; OCS *slŭnice* ‘sun’; Goth. *sauil* (neut.) ‘sun’, *sunnō* (fem.) ‘sun’, OHG *sunna* (Ger. *Sonne*), OE *sunne* (Engl. *sun*), Lat. *sōl*, gen. *sōlis* (neut.) ‘sun’; cf. with figurative meanings Alb. *hyll* ‘star’, OIr. *súil* ‘eye’; in Hittite and Tocharian the original word is replaced, by a Hattic loan in Hittite (Hitt. *Ištanu-* ‘sun god’, beside Hatt. *Eštan*) and by a derivative from a form meaning ‘early morning’ in Tocharian (Toch. A *koṃ*, B *kaum* ‘sun’, cf. Skt. *śóṇa-* ‘morning hour’). In Luwian and Palaic the term for ‘sun god’ (Luw. *Tiwat-*, Pal. *Tiyat-*) is derived from PIE **t’yeu-* ‘sky god’. Armenian *arew* ‘sun’ can be compared to Skt. *raví-* ‘sun’ and probably Hitt. *ḫar(u)wanai-* ‘dawn’ (see Eichner 1978).

5.5.2. Indo-European terms for ‘moon’ and ‘month’

The Indo-European term for ‘moon’ appears in two dialect variants, **meH-s-*

16. There is a perfect correspondent to this form in the name of the Kassite sun deity *Šuriyaš*, which appears in a list together with non-Indo-European names of gods: see Scherer 1953:48, Mayrhofer 1966, 1974, but also Kammenhuber 1961, 1968:47ff.

(in Indo-Iranian) and **me(H)-n-*, both derived from **meH-* ‘measure (time)’.¹⁷ The moon was thus seen as a measure of time. Skt. *māh*, *māsa-* ‘month’, ‘moon’, Avest. *mā*, Arm. *amis*, gen. *amsoy*, Pers. *māh* ‘moon’, Gk. Att. *mēn*, Ion. *meís*, Dor. *mēs* ‘moon’, ‘month’, Lith. *mėnuo*, *mėnesis* ‘moon’, ‘month’, OCS *měsęcĭ* ‘moon’, ‘month’, Alb. *múaj*, Goth. *mēna* ‘moon’, Toch. A *mañ*, *maññkāt* ‘moon god’ (see Normier 1980), B *meñe* ‘month’, ‘moon’, Ir. *mí* ‘month’, cf. Lat. *mēnsis* ‘month’.

Several branches form additional words for the moon based on its luminescence (see Ondruš 1968 for terms for moon and month in Indo-European dialects): Lat. *lūna* ‘moon, moon goddess’, Mlr. *luan* ‘moon’, OCS *luna* ‘moon’, Arm. *lusin* ‘moon’ (cf. Gk. *lukábās* ‘new moon’ from the same root), from PIE **loukhsnā-* ‘shining body’, preserved in Avest. *raoxšna-* ‘light’, OPruss. *lauxnos* (pl.) ‘heavenly bodies’, and in Slavic forms such as Pol. *łuna* ‘firelight’, Russ. dial. *lun* ‘dim light’.

The Anatolian terms for ‘moon’ and ‘month’, Hitt. *arma-* and Luw. *arma-*, differ from those in the rest of Indo-European, as do the Anatolian words for ‘sun’. The sun and moon had special cultic significance in Anatolian (Laroche 1955), and the words for them are distinctive, without secure Indo-European etymologies. Anatolian *arma-* ‘moon’ may be a word connected with the rising of the moon, a verbal form *ar-* ‘arise, rise’ plus *-ma-* suffix. This pan-Anatolian word is also related to derivatives such as Hitt. *armahḫ-* ‘make pregnant’ (based on monthly physiological cycles) and *armaniya-*, *irmaniya-*, *irmaliya-* ‘get sick’, *irma-* ‘illness’, which reflect cultic views of the moon as the source of evil and illness.

5.5.3. Indo-European mythological conceptions of the moon and sun

In some early Indo-European traditions the moon and sun are seen as a pair of beings, united by marriage (the moon is the husband, the sun the wife) or kinship (twins); this may continue Proto-Indo-European views of the moon and sun (see Mannhardt 1875, Ivanov and Toporov 1974:15-21).

5.5.4. Indo-European ‘star’ and its Semitic connections

The Proto-Indo-European word for ‘star’ is reconstructed as **Hasther-*: Hitt. *ḫašter-* ‘star’, Ved. *stṛ-bhiḥ* (instr. pl.) ‘with stars’ (nom. *tārah*), Avest. *stərəbyō*, Arm. *astł*, Gk. *astēr*, gen. *astéros*, Hom. *ástra* (pl.), also Gk. *teréōn* (gen. pl.) ‘of constellations’, Hom. *teírea* (nom. pl.), Lat. *stēlla* < **stēl-na*; Mlr.

17. Cf. Skt. *māti*, *mīmāti* ‘measures’, Lat. *mētor* ‘I measure’, OCS *měra* ‘measure’; also Hitt. *meḫur* ‘time’, Goth. *mēl* ‘time’, Lith. *mėtai* ‘year’, Alb. *mot* ‘year’, etc.

ser, Corn. *sterenn*; Goth. *stairnō*, OHG *sterno* (Ger. *Stern*), OE *steorra* (Engl. *star*), OIcel. *stjarna*; Toch. B *ściryē*, pl. *ściriñ*, A nom. pl. *šreñ* (Friedrich 1969, Watkins 1974a).

In Balto-Slavic the original Proto-Indo-European term is replaced by derivatives from a root meaning 'shining, bright': cf. on the one hand OCS *zvězda* 'star', Pol. *gwiazda*, Lith. *žvaigždė*, Latv. *zvaigzne* 'star' beside OPruss. *swāigstan* 'shining, light, luster'; on the other hand, OPruss. *lauxnos* 'heavenly body, constellation' (see 5.5.2 above).

PIE **Hasther-* 'star' is strikingly similar to Proto-Semitic **caṭtar-* 'deified star; Venus' (Fronzaroli 1965:IV.248): Akkad. *Ištar* 'the goddess Ishtar' (whose name was written with an ancient star sign); Hebr. *caštōreṭ* (fem.), Phoen. *cštr* 'Astarte' (goddess of fertility and war), South Arabian *cṭr* (Henninger 1976), Egypt. *ištr*.¹⁸ The Indo-European form coincides with the Proto-Semitic form not only in its initial laryngeal (reconstructed with certainty on the evidence of the Hittite data) but also in the specific reflex of the Semitic interdental spirant **t̪* as the Indo-European palatalized sibilant **š*, which gives reflexes of **s* and *∅* in the various dialects (thus Gk. *teírea*, Skt. *tāraḥ*, etc.).

5.5.5. Dialect terms for stars and constellations

Despite the variety of terms for stars and constellations in the Indo-European dialects, there is significant semantic parallelism in names for certain constellations (see Scherer 1953, 1974). For instance, the Big Dipper is called a carriage in Greek (*hámaksa*), Phrygian (*kíklēn*), Latin (*plaustrum*), Germanic (OHG *wagan*, OIcel. *vagn*), and Hittite (the Sumerogram *GIŠGIGIR*).¹⁹ These terms are not cognate and therefore give no basis for a Proto-Indo-European formal reconstruction. We can suggest a Proto-Indo-European metaphor 'carriage' for the Big Dipper with some degree of certainty, but we cannot reconstruct an actual word. Likewise, for a number of other star and constellation names that are consistent across several dialects (examined in detail in Scherer 1953, a study devoted to astral terms among the Indo-European peoples), we can reconstruct the semantics of the Proto-Indo-European names but not their form.

18. For the Semitic connection of these Indo-European words see Zimmern 1917, Illič-Svityč 1964. Scherer's objections (1953:23) to the connection are based on unimportant semantic distinctions and are not convincing, particularly if the Hittite form, not mentioned by Scherer, is taken into account. Scherer's objections are actually motivated by his assumption that the Proto-Indo-European homeland was located away from the Semitic linguistic world, rather than on any actual impossibility of a semantic connection of IE 'star' with Semitic 'astral deity, deified star'.

19. A typologically identical conception is found in Sumerian itself, where the Big Dipper is called a carriage: cf. *mul GIŠgigir* 'constellation in the form of a carriage' in the Sumerian text 'Enki and the World Order' (see Falkenstein 1964:80, 107).

Chapter Six

Economic activity, material culture, crafts, transportation

6.1. Reconstruction of ancient Indo-European economic activity from linguistic data

6.1.1. *The terminology of economic activity*

The Proto-Indo-European flora and fauna and a picture of the geographical and ecological environment of the speakers, both reconstructed from lexical data, can help reconstruct an approximation to other fragments of the Indo-Europeans' economy and occupations. Terms reflecting the economic activity and everyday material life of the tribes speaking Indo-European dialects gain particular significance in this context. They are naturally connected with the problem of the social organization of the tribe, which is reflected in Indo-European lexical items.

Working backwards and reconstructing individual Proto-Indo-European terms and larger text fragments having socio-economic meanings, one can reconstruct a picture of the general structure of the economic and social organization of the Indo-European tribes, which can then be related to particular archeological cultures. The only possible basis for the identification of such cultures is the chronological correspondence and material agreement of an entire complex of reconstructed data with the given archeological culture.

6.2. Agricultural terminology

6.2.1. *Indo-European words for 'plow' and plowing*

PIE ***Har-** 'work land; plow': Hitt. *ḫarš-* 'work land for sowing' (also 'plow' in combination with *ter(i)pp-*, cf. Gk. *drepánē* 'sickle': Rosenkranz 1967:501-2),¹

1. However, for a possible connection of Hitt. *ḫarš-* with Semitic (Akkadian *ḫarāšu* 'plant', *ḫarāṣu* 'make furrow') see Puhvel 1964.

Toch. A, B *āre* 'plow', Hom. Gk. *aróō* 'plow',² Lat. *arō* 'plow, work land', OIr. *airim* 'plow', Goth. *arjan* 'plow', OIcel. *erja* 'plow', OHG *erran* 'plow', Lith. *árti* 'plow', Latv. *aŕt* 'plow', OCS *orjъ* '(I) plow', inf. *orati*.

The same root forms derivatives meaning 'plow' and 'plowed field, arable land', although these are more restricted dialectally and could therefore have arisen in separate dialect groupings after the breakup of Proto-Indo-European unity.

A dialectal word for 'plow' can be reconstructed as ***Har-Ḥ-thro-m**: Hom. Gk. *árotro*n 'plow', dial. *áratro*n (cf. Arm. *arawr* 'plow'), Lat. *arātrum* 'plow', Mlr. *arathar* 'plow', OIcel. *arðr* 'plow'. The dialect distribution, with cognates in Greek and Italic-Celtic, testifies to the antiquity of the word, although there are no formal grounds for dating it back to Proto-Indo-European. In other dialects a term for 'plow' can be formed from the same root ***Har-** with different suffixes: Toch. A, B *āre* 'plow', Lith. *árklas* 'plow', OCS *ralo* 'plow'. In Germanic a new form appears alongside the old stem: OE *plōh*, pl. *plōges* (Engl. *plow*), with unclear etymology; this word was borrowed from Germanic into Slavic: ORuss. *plug*" (Puhvel 1964).

The Indo-European word for 'field, cultivated land' goes back to roughly the same dialect grouping: Hom. Gk. *ároura*, Myc. *a-ro-u-ra* 'field, arable land', Mlr. *arbor* (< **arwrj*) 'grain', Lat. *aruum* 'plowed field, arable land', *aruus* 'plowed (ppl.)', cf. Arm. *haravunk* 'cultivated land, field'. If Skt. *urvara* 'plowed field' is cognate, great antiquity must be ascribed to this word; but see Mayrhofer 1956:I.110 for formal difficulties.

6.2.2. The Indo-European term for sowing

PIE ***seH(i)-** 'sow': Hitt. *šai-/šiya-* 'sow; press into the ground', *para šiyatar* 'area left unsown or missed in sowing'³ (Laroche 1963:75-76, Rosenkranz 1967:504-5), Lat. *serō* 'sow', *sēuī* 'sowed', *sātus* 'sown', Goth. *saian* 'sow', OHG *sāen* (Ger. *säen*), OE *sāwan* (Engl. *sow*), Lith. *sėjū* 'sow', OCS *sějъ* 'sow'.

Obviously formed from the same root is a nominal derivative in ***-men** meaning 'seed, semen': Lat. *sēmen* 'seed, semen', OHG *sāmo* (Ger. *Same*), Lith. *sėmenys* 'flax seeds', OPruss. *semen* 'seed', OCS *sěmę*; also Hitt. *šamana-* with the somewhat different meaning 'foundation' (symbolically the 'seed' or 'root' of a house). Based on its dialect distribution, ***sēmen-** 'seed, semen' must be

2. In addition to Gk. *aróō* the form *arádō* is also attested; together with the Baltic forms and a few others it gives grounds for reconstructing a final syllabic laryngeal, presumably suffixal: ***Har-Ḥ-**.

3. This combination with the prefix ***p̥rō-** may be regarded as Proto-Indo-European in view of its wide dialect distribution: in addition to Hitt. *para šiyatar* 'area missed in sowing' there is Russ. *pro-sev* id., Goth. *frasts* < **pro-s(a)-ti-s* 'child' (Pokorny 1959:890), Mlr. *ross* 'flax seed'.

considered Proto-Indo-European, with a secondary replacement in a few historical dialects: Avest. *taoxman-* 'seed', OPers. *taumā-* 'seed; embryo', cf. Skt. *tókman-* 'sprout'.

More numerous are the Indo-European derivatives in **-th-* from the same root **seH(i)-*: Hitt. *šatta-* 'implement for working fields' (Rosenkranz 1967:504), Skt. *śītā* 'furrow (in a field)' (Thieme 1953:25, q.v. for Skt. *śīra-* 'plow', formed from the same root plus *-ra-* suffix), OHG *sāt* 'area missed in sowing; seed' (Ger. *Saat*), Goth. *mana-sēþs* 'the human race', lit. 'human seed', Bret., Welsh *had* 'seed'.

In view of the dialect distribution of its derivatives — Hittite plus other Indo-European dialects — the root **seHi-* can be dated back to the period of Proto-Indo-European unity.

6.2.3. Dialect terms for '(plowed) furrow'

Two forms, **šwelkh-/swelkh-* and **pherk̑h-*, can be reconstructed with the meaning 'furrow' in separate dialect groupings.

**šwelkh-*, originally 'pull, draw' (Toch. B *sālk-* 'pull', Hom. Gk. *hélkō* 'pull', Avest. *varək-* 'pull', Lith. *velkù* 'pull', OCS *vlěkq* 'draw, pull'), naturally yields two meanings in a number of early dialects: 'plow', Gk. (Lacon.) *eulákā* 'plow' (from *e-wl̑k-ā*), OE *sulh* 'plow'; and 'furrow, make furrow',⁴ Lat. *sulcus* 'furrow', *sulcō* 'make a furrow; plow', Gk. (Doric) *ōlaks* 'furrow'.

**pherk̑h-*, originally 'scratch; make hole or depression in the earth' (Skt. *pársāna-* 'depression, abyss', Lith. *pra-paršas* 'pit'), acquires the additional meaning 'furrow' in the western dialect area: Lat. *porca* 'furrow; row (in garden); irrigation rill', Gaul. *rica*, Welsh *rhÿch* 'furrow', OHG *furuh* (Ger. *Furche*), OE *furh* (Engl. *furrow*).⁵

6.2.4. Dialect terms for '(iron) plow', plow parts, and 'wooden plow'

Another dialect word having to do with the plow is **woghoni-* (Pokorny 1959:1179-80), with reflexes in the Greek-Germanic-Italic dialect area: Gk. *ophnís · hún̄nis, árotron* (Hesychius), OHG *waganso*, Oícel. *vangsni* 'plowshare', Lat. *uōmis, uōmer* 'plowshare'. In part of this same dialect area (Slavic-

4. The semantic shift from 'pull' to 'plow; furrow' finds a natural explanation in agricultural practice, where the plow was pulled by animals: cf. Hom. Gk. *helkémenai ... árotron*, Iliad 10.353, 'pulling the plow'; from this semantic source, both the plow and the furrow it made came to be referred to by the word originally meaning 'pull'.

5. Hitt. *aggala-* 'furrow for planting' is a probable loan from Akkad. *eklu* 'field', status constructus *ekel*. Kammenhuber connects Hitt. *akkala-* etymologically with Skt. *ájra-*, Gk. *agrós*, etc. (Friedrich and Kammenhuber 1975:I.52), which is implausible in view of formal difficulties.

Germanic-Celtic) we find a specialized term for 'plow' or 'wooden plow', ***ĥhak-**, originally 'branch, pole, stake' (Skt. *śākhā*, Mlr. *géc*, etc.): Slav. *soxa* 'stake; plow (esp. wooden)', Goth. *hōha* 'plow' (see Ramat 1974:72-74), OIr. *cécht* 'plow'.

6.2.5. *Culture-historical data on the spread of the iron plow*

Among implements for working the earth and making furrows, the wooden plow appears much earlier than the more massive iron plow, which was drawn by animals.⁶ The earliest evidence for sticks used to make furrows goes back to the Neolithic. The metal plow appears much later. In the ancient East the first evidence of iron plows, dated to the turn of the fifth and fourth millennia B.C., comes from Sumer (Semenov 1974:217). The iron plow enters Europe from the east no earlier than the middle of the second millennium B.C. (Semenov 1974:218, Clark 1952:100ff.[1953:108ff.], Wailes 1970:280, Haudricourt and Delamarre 1955).

The reconstructed Indo-European word for 'iron plow', ***Har-Ĥ-thro-m**, associated with an ancient dialect grouping, could not have arisen in that meaning later than the third millennium, when the individual historical dialects (including Greek, where this word is attested) were formed: see Cowgill *apud* Wailes 1970:301. This means that the dialect grouping in question, Greek-Italic-Celtic-Germanic, must be connected to the Southwest Asian area, where the earliest metal plows and plow agriculture first arose.

6.2.6. *Indo-European terms for seasons based on agricultural cycles*

PIE ***Ham-** 'time of ripening; harvest time; harvest (verb)': Hitt. *ḫamešḫa-* 'time of ripening' (cf. the Akkadian correspondent *i-[si]-en-ni* in the bilingual text KUB IV 3 I 13: Friedrich 1952:49), hence metaphorically 'spring', 'beginning of the year'; Hom. Gk. *amáo* 'reap, harvest', *amēiēr* 'reaper', *ámētos* 'harvest'.⁷

PIE *(**e**)**s-en-** 'harvest time; summer': Hitt. *zena-* 'autumn' (cf. *zeni*,

6. The greater typological age of the wooden plow in comparison to the metal one cannot, however, serve as grounds for automatically assuming the absolute antiquity of the wooden plow in individual cultures. A culture long familiar with the metal plow might turn to the wooden one as a result of changed ecological conditions. For instance, the lack of an ancient word for 'metal plow' among the Slavs could be explained by loss of the original word due to migration to new forest regions where plowing was possible only with a wooden plow: see Zelenin 1927:13ff.

7. In a number of dialects 'spring' is a reflex of PIE ***wes-ŕ/ŕ-(th-)**: Skt. *vasantá-* 'spring', *vāsará-* 'morning' (adj.), Avest. *vaŕri* 'in spring', Arm. *garun* (from **wesr-*) 'spring', Gk. *éar*, gen. *éaros*, Lat. *uēr*, gen. *uēris*, OIr. *errach* 'spring', Lith. *vāsara* 'summer', Latv. *vasara* 'summer', OCS *vesna* 'spring'.

dat.-loc. 'in autumn'), Goth. *asans* 'harvest; summer', OIcel. *qnn* 'harvest; effort', OHG *aran* 'harvest' (cf. Ger. *Ernte*), ORuss. *osen* 'autumn' (loc. *oseni* 'in autumn'), OPruss. *assanis* 'autumn' (Toporov 1975:I.130-31), cf. Arm. *ašun* 'autumn', Hom. Gk. *op-órē* 'end of summer; autumn; harvest time' (the Greek form points to an alternating base in **-r-/*-n-* for Indo-European).

PIE **meH(i)-* 'ripen; harvest (verb); time of ripening harvest': Hitt. *mai-/miya-* 'ripen, grow, flower', mediopass. 'be born', cf. Skt. *mímīte* 'is conceived; ripens' (of a fetus in the womb: RV 632, 11); 'reveals strength', cf. Toch. B *maiyya* 'strength', *maiwe* 'young' (Rosenkranz 1967:503), Lat. *metō* 'reap; harvest', Mlr. *meithel* 'group of reapers', OHG *māen* (Ger. *māhen*), OE *māwan* (Engl. *mow*) 'reap; harvest'.

It should be noted that the same Indo-European root is also connected with **meH-* 'measure' and 'time': Hitt. *meḫur* 'time', Skt. *māti*, *mīmāti* 'measures', Goth. *mēl* 'time', Lat. *mētiōr* 'measure'. If we admit an original identity of these two roots, the original meaning is not entirely clear. If 'ripen; gather harvest' is the original meaning, the senses 'measure' and 'time' could reflect a generalization from the season of ripening grain and harvest to the notion of season or time in general.⁸

This interpretation of these meanings may point to particular significance of the agricultural cycle, where the ripening of crops was connected with the seasons.

6.2.7. Indo-European terms for 'sickle'

PIE **serph-* 'sickle; implement for harvesting': Hitt. *GIŠšarpa-* 'agricultural implement' (possibly one used for harvesting), deified together with the plow in rituals (KUB X 92 V 13), see Gurney 1940:90-91; Gk. *hárpē* 'sickle', Oss. *æxsyrf* 'sickle' (beside Skt. *śrṇí* 'sickle'), Russ. *serp*, Czech *srp* 'sickle', Latv. *sirpis* 'sickle'; cf. also Lat. *sarpō* 'cut', OHG *sarf* 'sharp; coarse'. In Sanskrit the word is replaced by a derivative of another root: Skt. *dātram* 'sickle' (going back to the Rigveda).

Another base **kherph-*, also connected with harvesting, apparently has greater dialectal restriction (Greek-Celtic-Germanic-Baltic) and cannot be considered Proto-Indo-European in this meaning: Gk. *krōpion* 'sickle', cf. *karpós* 'fruit'; Mlr. *corrán* 'sickle', OE *hærfest* 'autumn' (Engl. *harvest*), OHG *herbist* (Ger. *Herbst*), OIcel. *harfr* 'harrow', Latv. *ciņpe* 'sickle', Lith. *kerpù* 'cut off'.

8. Typologically, such an instance of semantic generalization from 'season when grain grows and ripens' to 'season' to 'time' can be seen in derivatives of IE dialectal **yēr-* in its original meaning: Serbo-Cr. *jarina* 'spring or summer harvest', Ger. *Jahn* 'row of cut grain' beside Gk. *hōros* 'time; year', Avest. *yārə* 'year', Goth. *jēr*, OE *gēar* (Engl. *year*), OHG *jār* 'year' (Ger. *Jahr*).

In the historical Indo-European dialects the terms going back to ***serph-** and ***kherph-** evidently referred to wooden-handled metal implements for harvesting grain.⁹ For the Proto-Indo-European period the corresponding implement may have been flint-bladed, to be replaced subsequently by one having a metal blade. Flint harvesting knives appear in the first agricultural settlements, from Central Asia (Anau) to Southwest Asia (Çatal Hüyük and Hacilar: Mellaart 1965:117-18) and later in Europe, beginning with the seventh millennium B.C. Subsequently they were replaced in the Near East by metal sickles, as metal technology evolved (in Egypt this occurred in the early Copper Age, in the fourth millennium B.C.: Childe 1934 [1956]). In some areas of Southwest Asia and Europe, metal and stone sickles coexisted for a long time (Semenov 1974:259ff., Clark 1952:110 [1953:117]).

6.2.8. Indo-European terms for grinding grain and 'mortar'

PIE ***pheis-/p̥his-** 'thresh; mill (grain)': Ved. Skt. *pināṣti* 'threshes; grinds', *piṣṭá-* 'threshed, ground', Avest. *pišant-* 'threshing', Gk. *ptíssō* 'thresh, grind', Lat. *pīnsō* 'thresh, grind', Lith. *paisýti* 'thresh barley a second time, cleaning it of husks' (Būga 1958-1961:I.300), Czech *pěchovati* 'stamp, pound, ram down'; nominal derivatives: Skt. *peṣṭar-* 'one who threshes', Lat. *pistor* 'miller, baker', *pīsō* 'mortar', *pīlum*, *pistillum* 'pestle', MHG *vīsel* 'mortar', OCS *pīšeno* 'meal, flour', OPruss. *som-pisinis* 'bread made from coarse-ground flour'.

Crushing and grinding grain in mortars (stone and wooden) with pestles is an ancient means of preparing grain, which precedes the appearance of grinding mortars and mills. Archaic types of such wooden mortars, made of oak, are found in Lithuania (see Semenov 1974:275-77).

PIE ***mel-** 'crush, divide; thresh; grind': Hitt. *malla-* 'thresh, grind', Toch. B *melyem* 'they crush', Toch. A *malywāt* 'you crush', Lat. *molō* 'grind', OIr. *melim* 'grind', Goth. *malan* 'grind', OIcel. *mala* 'grind', Lith. *malù* 'grind', OCS *meljq* 'grind'.¹⁰

The dialect distribution of the words for 'grind' firmly establishes the Proto-Indo-European character of ***mel-** 'crush, grind'. Only in a few of the historical dialects (Greek-Armenian-Aryan) is the original word replaced in this meaning by a new formation: Gk. *aléō* 'grind', Hom. *kataléō* id., Arm. *a-łam*

9. This can also be inferred from the earliest evidence for this agricultural implement in Indo-European tradition: Hitt. *GIŠšarpa-*, which could be burned for ritual purposes (i.e. its wooden handle could be burned: *GIŠšar-pa-aš ḫa-aš-du-ir me-ir-ra-an-da wa-ar-nu-zi*, VBoT 24 III 30-31 '(he) burns the perishable handle of the sickle') and which could be 'inlaid with gold': *GIŠšarpa* GUŠKIN GAR.RA (Bo 703, Vs. 9).

10. In Sanskrit the primary root *mṛṇāti* is preserved in the unspecialized meaning 'smash, break into pieces'.

'grind', Avest. *aša-* (< **arta-*) 'ground' (ppl.), Pers. *ārd* 'flour', Hindi and Bengali *āṭā* 'flour'.

6.2.9. Indo-European terms for 'mill', 'millstone'

The same root **mel-* 'grind' is also related to a dialectal term for 'grinder' and 'mill', **m̥l-/mul-*, attested in individual historical dialects: Gk. *múlē* 'mill', Bret. *meil* (**melyā*) 'mill', Lat. *molīna* 'mill', OIcel. *mylna* 'mill', OPruss. *malunis* 'mill'.

Interestingly, in some dialects the general word for 'woman' is related to this word for 'mill': Lat. *mulier* 'woman', cf. also Arm. *ałj-ik* 'young girl' beside *ałam* 'grind', *aławri* 'mill'. Milling was obviously a woman's occupation in antiquity. Hittite facts pointing to a connection of 'mill' (evidently a hand mill) and 'woman' are important in this regard: there is a Hittite ideogram SAL NA₄ARÀ ('woman) miller', lit. 'woman of the millstone'. In many Near Eastern cultures, milling by means of a hand grinder is primarily a woman's occupation.

The same root **mel-* produces an Indo-European word for the flour or meal resulting from milling, lit. '(that which is) ground': Hitt. *memal* (reduplicated root) 'meal' (evidently coarse-ground), Alb. *miéll* 'flour', OHG *gimulli* (Ger. *Gemüll*), *mēlo* (Ger. *Mehl*), OE *melu* (Engl. *meal*), OIcel. *mjql* 'flour', Serbo-Cr. *mlēvo* 'grist, flour'.

The most important part of a grinder or mill is the millstone, PIE **k'orāu-*, represented by cognates in a broad group of Indo-European dialects: Skt. *grāvan-* 'stone for crushing soma', Arm. *erkan* 'millstone', OIr. *bráu*, gen. *broon* 'millstone; hand grinder', Goth. (*asilu*)-*qairnus* '(donkey-powered) mill', OIcel. *kvern* 'millstone', OE *cweorn*, OHG *quirn* 'millstone', OPruss. *girnoywis*, Lith. *girna*, Latv. *dziņņus*, OCS *žrūnovŭ* 'millstone'. The stem is related to the PIE root **k'oer-* 'heavy': Skt. *gurú-*, Gk. *barús*, Lat. *grauis*, etc. (Vendryes 1952a).

The earliest archeological evidence for grinding mortars, which are of the most primitive saddle-shaped type, comes from northern Iran (the Sialk culture of about the fifth millennium B.C.: Semenov 1974:280); the same type is reflected in Egyptian art of the Fifth Dynasty. From the Near East this kind of mill is assumed to have entered Europe at a much later date (there is evidence from the Bell Beaker culture of Tripolye dating to about the third millennium B.C.: Clark 1952:113[1953:120]).

Since the Indo-Europeans had a term for 'millstone', **k'orāu-*, they also had mortars for grinding or milling, **mel-*, as well as the more primitive mortar

and pestle, ***p̥heis-/p̥his-**. This terminology is another piece of evidence for links between Proto-Indo-European and the agriculture of Southwest Asia.¹¹

6.2.10. Dialect terms for 'grain'

No Proto-Indo-European word for 'grain' can be traced with confidence in all the dialects. There is only the dialectally restricted ***k̑r̥-no-**, limited to the western dialect area: Lat. *grānum* 'grain', OIr. *grán* 'grain', Goth. *kaúrn* 'grain', OHG *korn* (Ger. *Korn*), OE *corn* 'grain' (Engl. *corn*), Lith. *žirnis* 'peas', OPruss. *syrne* 'grain', OCS *zrīno* 'grain'. In other dialects we find other roots, thus precluding reconstruction of a single Proto-Indo-European word in this meaning: Hitt. *ḫalki-* 'grain', Skt. *dhānāḥ* (pl.) 'grain', Avest. *dānō-* 'grain' beside Lith. *dūona* 'bread' (cf. Lith. *žirnis* in the more restricted sense 'peas').

6.3. The terminology of herding and hunting

6.3.1. Terms for herding and guarding flocks

In addition to the words for the various types of livestock surveyed in Chapter 3 above, the herding economy of the Indo-Europeans is reflected in a number of other lexical items with specialized semantics.

PIE ***Haḱ'ro-** 'unworked field for grazing' (Thieme 1964:591-92): Skt. *ájra-* 'pasture', Hom. Gk. *agrós* 'field; pasture' (e.g. Iliad 5.137), cf. *ágraulos* 'one who spends the night in the field' (of shepherds, Iliad 18.162, and of flocks), Lat. *agrestis* 'pertaining to a field; wild', cf. *peregrē* 'outdoors; in foreign lands'. In a few historical dialects the word acquires the secondary meaning 'worked field' (see Grassmann 1863:23): Goth. *akrs* 'field', OE *æcer* 'field, arable land, acre' (Engl. *acre*), OHG *ackar* (Ger. *Acker*).

PIE ***phaH-/p̥hoH(i)-** 'guard' (especially livestock), 'herd': Hitt. *paḫṣ-* 'guard', Toch. A *pās-*, B *pāsk-* 'guard', Skt. *pāti* 'guards', Avest. *pāiti* 'guards', Lat. *pāscō* 'tend flocks', OCS *pasq* id. Derivatives of this root yield the meanings 'flock, herd' and 'herder, shepherd' in dialect groups: Hom. Gk. *pōu* 'flock, herd', cf. Skt. *pāyú-* 'defender, protector' (used of gods in the Rigveda), Hom. *poimén* 'shepherd', Lith. *piemuō* 'shepherd'; Skt. *go-pā-* 'herder' (lit. 'protector of cattle'), *avi-pā(lá)-* 'shepherd', cf. Arm. *hoviw* 'herder' (from ***Howi-p̥haH-**), Lat. *pāstor* 'shepherd', OCS *pastyrĭ* 'pastor', *pastuxŭ* 'shepherd'.

11. A word for 'millstone' can also be reconstructed for Semitic: **raḫay-*. There is also a verbal form **ṭḫan-* 'grind (grain)': see Fronzaroli 1971:VII.617-18.

6.3.2. The ancient term for 'herder', 'shepherd'

PIE ***wes-ther-** 'shepherd, herder': Hitt. *weštara-* 'herder', Avest. *vāstar-* 'herder'; cf. Hitt. *wešiya-* 'tend flocks', *weši-* 'pasture'. Despite the restricted attestation, limited to two languages (Hittite and ancient Iranian), the dialect distribution points to extreme antiquity of the word and makes it datable to the Proto-Indo-European period. In the remaining dialects this word was displaced by derivatives of ***phaH-/phoH(i)-** 'guard flocks'. Hittite and Tocharian preserve the original meaning of this word, 'protect; preserve, observe' (not only, and not primarily, livestock), as shown in Hitt. *uttar paḥš-* 'observe, keep word (commandment)', *paḥḫur paḥš-* 'keep fire going', etc. The specialized meaning 'guard livestock' stabilized only after the Anatolian and Tocharian groups separated from the Indo-European dialect community.

Another Indo-European dialect word for 'shepherd' can be seen in cognate derivatives of ***kʰoel-**: Gk. *boukólos* 'cattle herder' (Myc. *qo-u-ko-ro-jo*) beside Mlr. *búachail*, Welsh *bugail* 'herder' (cf. Alb. *á-sull* 'winter pasture'); for Indo-European terms for 'herder' and herding, see Bader 1976a.

6.3.3. Indo-European terms for hunting

Despite the lack of a Proto-Indo-European term for hunting as a form of economic activity, we can nonetheless reconstruct individual Proto-Indo-European lexemes of a local character which had to do with one or another aspect of hunting. They allow us to determine the overall character and individual features of hunting among the Indo-European tribes and to establish their typological characteristics.

Words with the general meaning 'hunt' and etymological connections to words meaning 'desire; solicit, court; love' can be reconstructed for individual Indo-European dialects: Hitt. *ḫurna-* 'hunt', *ḫurnai-* 'court, solicit; fertilize'; Lat. *uēnor* 'hunt' and 'solicit, court', hence *uenus* 'love' (noun); Russ. *oxota* (noun), *oxotit'sja* (verb) 'hunt' beside *xotet'* 'want';¹² Skt. *lubdhaka-* 'hunter' and *lubh-* 'wish, desire; solicit, court', cognate to Russ. *ljubit'* 'love'.¹³ This may explain the lack of a Proto-Indo-European word for 'hunt': the original word must have been tabooed in individual dialects or possibly even earlier, replaced by euphemistic formations with almost identical connotations (see Zelenin 1929-1930:I:125, Vasmer 1953-II:294 [1964-1973:III:176]).

The very fact of taboo and replacement by euphemisms points to the con-

12. Cf. syntactically similar constructions with the Indo-European verb ***ei-/i-** 'go': Hitt. *ḫurnuwanzi pai-* 'go hunting' (Ehelolf 1930:148-49), Lat. *uēnātum ire* 'go on a hunt', Russ. *iditi oxotit'sja* 'go hunting'.

13. The ancient Germanic word for 'hunt' obviously had similar meaning: OHG *jagōn* 'hunt' (Ger. *jagen, Jagd*), comparable to Skt. (*prá-jyakṣa-* 'strive' (Grassmann 1873:1069).

siderable economic and ritual significance of hunting, which the ancient Indo-Europeans evidently connected with various superstitions. This is consistent with the numerous instances of tabooing of names of wild animals.

Also relevant to the hunting terminology of Indo-European antiquity is the root **s/šekho-* 'see, look; eye; view' and also 'follow'. PIE **še/okho-* 'see; eye': Hitt. *šakuwa* 'eyes', *šakuwai-* 'see, look', Goth. *saihan* 'see', OIcel. *sjá* 'see', OE *sēon* (Engl. *see*), OHG *sehan* (Ger. *sehen*), OIr. *rosc* 'eye; view' (**pro-skwo-*), Alb. *shoh* 'see, look' (cf. also I.2.4.2 above). PIE **sekho-* 'follow, pursue': Skt. *sácate* 'follows', Hom. Gk. *hépomai* 'follow', Lat. *sequor* 'follow, pursue' (e.g. *hostem* 'an enemy'), OIr. *sechithir* 'follows', Lith. *sėkti* 'follow', *at-sėktas* 'tracked, pursued' (participle).

If we project the cooccurrence of both meanings in a single word onto the Proto-Indo-European level (which is supported by the presence of both meanings in Celtic and in Baltic: OIr. *rosc* 'view, eye' and *sechithir* 'follows'; Lith. *sėkti* 'follow with the eye' and 'follow': Būga 1958-1961:II.584),¹⁴ we must posit a common word **s/šekho-* with the meanings 'eye; view; look, see' and also 'follow, pursue'. This combination of meanings becomes understandable through the intermediary meaning 'follow with the eye', 'not let out of sight', used with the quarry as object. **s/šekho-* therefore belongs to the earliest hunting terminology of Proto-Indo-European (Vendryès 1949-1950, Pokorny 1959:896-97). Its original use as a hunting term is preserved to this day in specialized contexts in historical dialects: Lat. *lupum sequor* 'pursue a wolf', Lith. *sėkti paukščio skridimą* 'follow a bird's flight with the eye', etc.

Another relic hunting term, reconstructible for Proto-Indo-European or in any event for a fairly early dialect stage (Aryan-Germanic-Celtic), is PIE **selk̑-*: OIr. *selg* 'hunting', *sleg* 'spear', OWelsh *in-helcha* 'hunting, during a hunt', *helgha-ti* 'hunt' (imperative), Welsh *heliwr* 'hunter', Bret. *di-elc'hat* 'be out of breath'; OE *be-sylcan* 'overpower' (Engl. *sulky*); Skt. *srjáti* 'let loose' (especially dogs: *srjáti súnaḥ*), Avest. *harəzaiti* 'lets loose, sends out'. Comparison of the meanings of these derivatives permits us to reconstruct for this early dialect stage a hunting term which probably described a particular type of hunting involving the use of dogs. Hunting with dogs is one of the oldest types of hunting, as is attested in a great number of ancient rock drawings; see Illustration 11 in Chapter 3 above.

14. The combination of these meanings in a single word can also be proposed for Hittite. There is a Hittite verb *šakuwai-* found in legal contexts and referring to a certain type of punishment (Friedrich 1952:177), which must mean 'follow' (in a specialized legal sense; cf. Russ. *sledovat* 'follow' : *pre-sledovat* 'prosecute', Lat. *sequor* '(I) follow' : *pro-sequor* 'prosecute'). If we assume this, the formal etymological connection of Hitt. *šakuwai-* 'see' and *šakuwai-* as a type of punishment (apparently a special type of prosecution) becomes clear. Hittite *šakuwai-* in its original meaning 'follow' is preserved only in this specialized legal meaning 'prosecute', in contrast to some other early Indo-European dialects, where the meaning 'follow' is kept but 'see, look' is lost.

These traces of a special hunting terminology in Indo-European testify to a fairly developed level of hunting which, together with farming and herding, must have been a basic economic activity of the ancient Indo-Europeans. Hunting remains one of the forms of economic activity even in a developing farming and herding culture; in such societies hunting is a means both of obtaining food and of protecting the household from wild animals.

6.4. Elements of ancient Indo-European material culture

6.4.1. General terms for food and eating

The food of the ancient Indo-Europeans was determined by their economic activity, and consisted of the products of herding, farming, and hunting. The Proto-Indo-European words that have been preserved for foods make it possible to determine the diet of the ancient Indo-Europeans.

General words for 'eat' and 'drink' can be reconstructed for Proto-Indo-European. PIE **et-* 'eat': Hitt. *etmi* '(I) eat', *adanzi* '(they) eat', Skt. *ádmi* '(I) eat', Avest. *aδāiti* 'let (him/her) eat', Arm. *utem* '(I) eat', Gk. *édomai*, Lat. *edō* '(I) eat', OIr. *estar* (**et-s-thro*) '(s/he) eats' (subjunctive), Goth. *itan* 'eat', OE *etan* (Engl. *eat*), OHG *ezzan* 'eat' (Ger. *essen*), Lith. *ėdu* '(I) eat', OCS *jamī* '(I) eat'.

Nominal derivatives of this root give words meaning 'food', 'fodder', with different suffixal formations providing a semantic opposition of human food to livestock fodder in individual dialects: Hitt. *etri* 'fodder' (cf. Hitt. *etriya-*, Luw. *adari* 'feed'), Laroche 1955:82; Gk. *ēdar* 'fodder; food' (Chantraine 1964:16); Lith. *ėda* 'food', Russ. *eda*, Bulg. *jada* 'food', OIcel. *áta* 'food, nourishment'.

A stem in **-nth-* acquires the meaning 'tooth' in a number of dialects: cf. Hitt. *adant-* 'eating; eaten' beside Skt. *dán*, acc. *dántam* 'tooth', Gk. *odōn*, gen. *odóntos* 'tooth', Lat. *dēns*, gen. *dentis*, OIr. *dét*, Goth. *tunþus*, OHG *zand* (Ger. *Zahn*), OE *tōð* (Engl. *tooth*), Lith. *dantīs* 'tooth'; cf., with a different suffix, Arm. *atamn* 'tooth'.

The root **et-* 'eat' is especially frequent as the second element of a compound with a preceding object, which points to the extreme antiquity of this structure: Skt. *madh(u)v-ád-* 'honey-eater', OCS *medv-ědī* 'bear', lit. 'honey-eater'; cf. Lith. *dūon-ėdis* 'bread-eater' (Būga 1958-1961:II.692); Skt. *kravy-ād-* (< *kravya-ad-*) 'flesh-devouring' (of Agni, Geib 1975), Hom. Gk. *ōm-ēstēs* 'flesh-eating' (of animals, Iliad 22.67), Ved. Skt. *āmād-* 'eating raw meat' (of carnivorous birds).

6.4.2. *The opposition of raw food to cooked food*

An opposition of raw to cooked food as a characterization of non-human vs. human food can clearly be reconstructed for Proto-Indo-European and is reflected in the individual historical dialects, e.g. Hitt. *huišwant-* ‘raw meat’ vs. *zanuwant-* ‘cooked meat’ (in Hittite rituals).

The word for ‘raw meat’ in Indo-European is reconstructed as ***khreuH-/khruH-**, ancestral to Skt. *kravīḥ* (neuter) ‘raw flesh, raw meat’, *kravyám* ‘raw meat’, *krūrā-* ‘bloody, terrible’, Avest. *xrūra-* ‘bloody, terrible’, *xrū-* ‘piece of bloody raw meat’, Gk. *kréas* ‘meat’, Lat. *cruor* ‘gore’, *cruentus* ‘bloody’, Mlr. *crú* ‘blood’, OIcel. *hrár* ‘raw, uncooked’, OHG (*h*)*rō* ‘raw’ (Ger. *roh*), Lith. *kraūjas* ‘blood’, OCS *krŭvĭ* ‘blood’.

Meat in general, indifferent as to whether cooked or raw, was designated by the generic term ***mēms-o-**, attested in all the main early dialects:¹⁵ Toch. B *mīsa* ‘meat’, Skt. *māmsám* ‘meat’ (cf. Ved. *māmsa-bhikṣā* ‘request for meat’ of the animal to be eaten, *māms-pácana-* ‘meat-cooking’), Arm. *mis*, gen. *msoy* ‘meat’, Hom. Gk. *mēría*, *mēra* ‘cuts of meat from the thigh’, Alb. *mish* ‘meat’, Lat. *membrum* ‘member’ (originally ‘part of body or carcass’), OIr. *mír* ‘piece (of meat)’, Goth. *mimz* ‘meat’, OPruss. *mensā* ‘meat’, Latv. *miēsa* ‘meat’, OCS *męso* ‘meat’.

A semantic opposition of cooked to raw which distinguishes human food from animal food is a typological feature of many cultures at various stages of development (Lévi-Strauss 1964), distinguishing them from cultures which make a less consistent demarcation of these categories (for this typology see Ingham 1971, Soler 1973).

6.4.3. *Cooking of food*

A generic term for preparation of food over heat can be reconstructed as ***phekhō-**: Toch. A *pāk-* ‘cook, be cooked; prepare, be prepared’, Toch. B *pākw-* ‘cook’, Skt. *pácanti* ‘(they) cook, fry’, Gk. *péssō* ‘(I) cook’, *arto-kópos* ‘baker’ (cf. Arm. *hac* ‘bread’ < ***phokho-thi**), Lat. *coquō* ‘(I) bake, cook’, Lith. *kepù* ‘(I) bake’, *kèpti* ‘bake; be baked, roasted’, OCS *pekq* ‘(I) bake’, Alb. *pjek* ‘(I) bake’.

Other words for preparation of food can be reconstructed for Indo-European: ***bhrek̑-/bhruk̑-**, Ved. Skt. *bhrījāti* (*dhānās*) ‘roasts (grain)’, cf. Gk. *phrúgetron* ‘vessel for roasted barley’, *phrúgō* ‘(I) roast, dry’, Skt. *bharjana-* ‘roasting’, MPers. *barštan* ‘roast’ (Pers. *birištan*), OLat. *ferctum* ‘sacrificial cake made of barley, honey, and butter’, participle of ***fergō** ‘(I)

15. The corresponding Hittite word is concealed behind the Sumerogram UZU (Akkadian *šīru* ‘meat’).

roast (barley)', Osc. *fertalis* 'ritual ceremony involving sacrificial cakes', Lith. *biŗgelas* 'home-brewed beer', Latv. *biŗga* 'fumes, smoke', OPruss. *aubirgo* 'restaurant owner' (Toporov 1975:I.143-44).

6.4.4. Indo-European terms for 'fire' and 'hearth'

Food was of course cooked over a fire, ***ph₂H₂Hur**: Hitt. *paḥḫur*, Toch. A *por*, B *puwar*, Arm. *hur*, gen. *hroy* 'fire', Gk. *pūr* 'fire', Umbr. *pir* 'fire', OIcel. *fúrr* 'fire', Goth. *fōn*, OE *fȳr* 'fire' (Engl. *fire*), OHG *fuir*, Ger. *Feuer*, OPruss. *panno* 'fire'.¹⁶ The fire burned in a hearth, ***Has-**: Hitt. *ḫašši*, dat.-loc. 'in the hearth', Osc. *aasaí* 'in the hearth', Lat. *āra* 'hearth'; compare the Old Hittite formula *ḫa-aš-ši-i pa-aḫ-ḫu-ur* 'fire in the hearth', BoTU 10 β 23-25, with Osc. *aasaí purasiaí* 'in the fiery hearth'.

6.4.5. The ritual role of the fire and hearth in ancient Indo-European traditions

Maintaining a fire in the hearth and preparing hot food obviously played an essential role in the Indo-European household and assumed ritual significance, as is reflected in the exceptional cultic significance of the hearth and the ritual group of cooks and preparers of food in Indo-European traditions. In Hittite tradition there are special instructions for keeping the fire (sometimes a ritual fire) in the hearth. Temple servers and other functionaries are called upon to fan the flames and keep the fire burning in the hearth: Hitt. *ḫa-aš-ši pa-aḫ-ḫu-ur pa-ra-iš-te-ni* 'you will fan the flames in the hearth', 2 BoTU 10 β 22, *nu IZI me-ik-ki pa-aḫ-ḫa-aš-tin* 'and preserve the fire excessively', KUB XIII 4 III 44. There were also special 'fire people' (LÚMEŠ *paḥḫuenaš*) whose obligations included watching the fire (KBo V 11 Vs. I 21-24). Special cooks (ideogram LÚMUḪALDIM), who prepared food during religious rites and ceremonies, formed a separate caste of functionaries who received allotments for their work. Cooks (LÚMUḪALDIM) are mentioned in the deed of Arnuwandas (KBo V 7 I Rs. 13, Rienischneider 1958:352).

Analogous ritual groups having an even more complex ritual function are also attested in ancient Roman tradition, where there were special colleges of cooks. From the archaic inscription of the Faliscan college of cooks (*Ququei*) it

16. This word belonged to the inactive class in early Indo-European and was opposed to the word for 'fire' as an active force, ***ḡk'ni-** (Skt. *agnī-*, Lat. *ignis*, OCS *ognī*). It is subsequently replaced in individual dialects (Sanskrit, Latin, Lithuanian-Latvian, Slavic) by the latter term. In other dialects, in contrast, ***ph₂H₂Hur** is generalized, replacing the earlier active word and thereby removing the original Indo-European opposition of words for fire based on the active or inactive nature of the referent. Evidently the word originally described a special way of preparing grain, in particular barley, over a fire.

is known that they made offerings to the highest gods (*Imperatoribus Summeis*) — Jupiter, Juno, and Minerva.

In Rome a public cult of fire, embodied by the goddess Vesta, continued to exist for a long time. Hearths of various types and shapes are attested: circular hearths dedicated to Vesta and quadrangular ones for other deities, which is analogous to the opposition of quadrangular and circular hearths in ancient India (Dumézil 1966:311; for Greece see Vernant 1969). The fire was usually made in the center of the house or in the center of the entire village or town (there is an analogous Caucasian tradition of a central location for the fire).

In Indic tradition a cult of fire and hearth is preserved for a long time (for the Iranian terms for 'hearth' see Eilers 1974); there are also ritual castes of cooks, comparable in type to those of the Hittites. The cooks prepared food during religious holidays and public ceremonies (Hocart 1970:116, 125).

6.4.6. *Ritual food offered to a deity*

Rituals involving preparing food and dedicating it to a deity, preserved in individual historical Indo-European traditions, may reflect very early practices going back to Proto-Indo-European. We can even posit a special term **t'aHph-* which denoted ritual food offered to the gods and eaten during festival ceremonies: Lat. *daps* 'ceremonial (cultic) table; food, meal, feast', cf. Toch. A *tāp-* 'eat', Arm. *tawn* 'festival', Oİcel. *tafn* 'sacrificial animal, sacrificial food'. Consequently, in addition to Indo-European **et-* in the general sense 'eat' we can also set up the base **t'aHph-* 'eat ritual food offered to a deity'. The original meaning of the word can still be clearly traced in its historical reflexes and their derivatives.

The semantics of the word is especially clear in Latin. Lat. *daps* is food for a feast, consecrated to the gods and including a great deal of meat and wine; it was eaten ceremoniously by participants in the consecration ritual (Benveniste 1966a:323ff.). A derivative in *-l-* forms an adjective denoting the deity the feast was consecrated to: *Juppiter Dapālis* 'Jupiter, honored by a ceremonial feast'. This derivative can be compared to Toch. A *tāpal*, used in a modal sense: 'what is to be eaten; food' (W. Thomas 1952:57, 62; cf. Van Windekens 1976:497), e.g. *śiskis tāpal mā pālskānt* 'they did not think of the possibility of being eaten by the lion'. Formally identical to these derivatives is Hitt. *LÚtappala-* 'person responsible for court cooking' (Friedrich 1952:210). The formal and semantic correspondence makes clear the etymological identity of Hitt. *tappala-* to the forms in the other Indo-European dialects. The presence of this stem in Hittite, Tocharian, and other dialects gives firm grounds for positing its existence in Proto-Indo-European in the sense '(eat) ritual food offered to a deity'.

6.4.7. *Exchange of food between people and gods; the word for 'hunger', 'famine'*

Sacrifices to the gods in ancient societies embodied a conception of reciprocity existing between people and gods. A sacrifice of food to the gods required an abundance of food, and this abundance was caused by the gods. If the reciprocity was broken, the gods might stop sending food to the earth, which would cause famine.

We can reconstruct an Indo-European word for 'hunger, famine' on the evidence of Hitt. *kašt-* 'hunger', *kištant-* 'hunger', Toch. A *kašt* 'hunger', B *kest* 'hunger'; cf. Skt. *jásuri-* 'starving, gaunt' (Mayrhofer 1956:I.425, Van Windekens 1976:168).

The theme of famine among people and gods due to breaking of the normal reciprocity plays a major role in Hittite ritual and mythological texts, evidently reflecting the earliest Indo-European conceptions. Thus the 'Prayer of Mursilis during the plague' expresses fear that the gods may die of hunger if the people stop sacrificing bread and beverages to them (Goetze 1929:239). In the Old Hittite myth of Telepinus, people starve because of the anger of the gods. Such motifs are a characteristic feature of early farming and herding societies, including that of the Indo-Europeans.

6.4.8. *Other terms for eating*

Also included in the Indo-European lexicon of words having to do with eating was **k'oer-* 'swallow', which gives specialized meanings 'eat greedily', 'consume food and drink' in the dialects: Skt. *giráti* 'swallows', *-gara-* 'swallowing' (in compounds like *aja-gará-* 'goat-swallower', referring to a serpent), Avest. *Jaraiti* 'swallows' (cf. *aspō-gar-* 'horse-swallower', *garāman-* 'throat, neck', Arm. *ker, kur* 'food', *kokord* 'throat', Alb. *ngrânë* 'eaten', Hom. Gk. *brómē* 'food', *brōsis* 'meal', *brōtús* 'food', *bibrōskō* 'eat one's fill', Gk. *borós* 'voracious', Lat. *uorō* 'devour', cf. *carni-uorus* 'meat-eating', OIr. *túarae* 'food', Lith. *geriù* 'drink', OCS *po-žirq* 'devour' (see Pokorny 1959:474-75).

6.4.9. *The Indo-European word for drinking*

The meaning 'drink' was conveyed in Indo-European by two roots, **ekho-* and **phoH(i)-*. **ekho-*: Hitt. *ekuzzi* '(he) drinks', *akuwanzi* '(they) drink', Luw. *aku-*, Hier. Luw. *aku-*, Pal. *aḫu-* 'drink', Toch. A, B *yok-* 'drink'; and cognates meaning 'water': Lat. *aqua* 'water', Goth. *alva* 'river', Olcel. *æger* 'sea god'. **phoH(i)-*: Hitt. *paš-* 'swallow', Gk. *pínō* '(I) drink', *pōthi* 'drink' (imperative),

and also *pōma* ‘drinking’, Skt. *píbati* ‘(he) drinks’, Lat. *bibō* ‘(I) drink’, OIr. *ibid* ‘(he) drinks’, OPruss. *poieiti* ‘drinks’, OCS *pijq* ‘(I) drink’, Alb. *pi* ‘drink’, Arm. *əmpem* ‘(I) drink’.

The existence of two reconstructed words presupposes a semantic specialization based on the understood object. To judge from the semantics of derivatives of these originally verbal roots (on the one hand Lat. *aqua* ‘water’, Goth. *ahva* ‘river, stream of water’; on the other, Lat. *pōtus* ‘drinking; beverage’, OCS *pivo* ‘beverage’, Skt. *pānam* ‘beverage’, etc.), ***ekho-** must have originally meant ‘drink water’ (thus Hitt. *watar ekutteni* ‘you will drink water’, Toch. A *wār yoktsi* ‘drink water’), while ***phoH(i)-** probably referred to drinking some beverage, perhaps ***medhu-** ‘honey; intoxicating beverage’, ***we/oino-** ‘wine’, or, plausibly, milk (these beverages and their Indo-European names are discussed above).

In addition to food, beverages were also sacrificed to the gods. The sacrificial food was usually sprinkled with beverages. The term for this sacrificial libation was ***sphent’-**, reflected in a number of early Indo-European dialects (see II.4.2.1.6 above).

6.4.10. *Indo-European terms for food prepared by heating*

Of the names of foods prepared by heating preserved in the individual dialects, ***yeu-s-** ‘(meat) soup, broth’ is undoubtedly of Proto-Indo-European date: Skt. *yūh/yūśán-* ‘soup; meat soup’, Lat. *iūs*, gen. *iūris* ‘soup, gravy’, OPruss. *juse* ‘meat soup’, Lith. dial. *jūšė* ‘fish soup; broth’, Slavic ***juxa**: ORuss. *uxa* ‘fish soup’, Slovene *júha* ‘soup’, Czech *jícha* ‘soup’; probably also cognate is Gk. *zúmē* ‘leavening’ (Pokorny 1959:507).

Another dialect word, referring to soup prepared by heating or by fermentation, is represented by ***khr-em-**: Skt. *karam-bhá-* ‘barley porridge; soup’, Lat. *cremor* ‘slimy thick juice’, Gaul. *koûrmi* ‘type of beer’, OIr. *coirm* ‘beer’ (Pokorny 1959:572), OCS *krūma* ‘fodder’, Russ. *korm* (Vasmer 1953:I.627-28 [1964-1973:II.329]).

6.4.11. *The Indo-European word for ‘salt’*

An indispensable item in preparing food from agricultural and meat products was salt, whose Indo-European name is reconstructed as ***sal-** on the evidence of Toch. A *sāle*, B *salysiye*, Gk. *hāls* ‘salt’, Arm. *ał* ‘salt’, Lat. *sāl*, OIr. *salann* ‘salt’, Goth. *salt*, OHG *salz* (Ger. *Salz*), OE *sealt* (Engl. *salt*), Latv. *sāls* ‘salt’,

OCS *solī* ‘salt’.¹⁷ In Sanskrit we find a semantic shift from ‘salty’ to ‘sea’: Skt. *sal-ilā-*, cf. Gk. *hāls* ‘sea’ (for details see II.5.3.7 above).

6.4.12. Indo-European words for oils

A generic term for ‘oil’ and ‘butter’ can be reconstructed as ***selph-**: Toch. A *šälyp*, B *šalype* ‘oil’ (olive), ‘butter’, ‘fat’, Skt. *sarpīs-* ‘melted butter; fat’, Gk. *élpos* ‘oil’, ‘*élaion*’ (Hesychius), Alb. *gjalpë* ‘oil, butter’, OHG *salba* ‘ointment’ (Ger. *Salbe*), *salbōn* ‘spread, rub on, smear’ (Ger. *salben*), OE *sealfian* ‘spread, rub on, smear’ (Engl. *salve*); see also II.3.1.3.3 above for words meaning ‘butter’.

Another word for oil, especially ointment and salve, is formed from ***ongho-**: Skt. *añjānti* ‘(they) spread on, smear, rub on’, *āñjah* ‘ointment, oil’ (e.g. *añjas-pā-* ‘oil-drinking, butter-drinking’), Arm. *awcanem* ‘rub on, smear’ (Meillet 1936:37), Lat. *unguō* ‘(I) anoint, smear’, *unguen* ‘fat, grease’, *unguentum* ‘ointment, liniment’, Umbr. *umtu* ‘rub on’, OIr. *imb* ‘oil’, OPruss. *anctan* ‘oil’, OHG *ancho* ‘oil’. The meaning of this word, attested in the historical dialects, gives the possibility of reconstructing the Proto-Indo-European meanings ‘liniment, ointment, salve’, ‘apply oil’, which indicates that oil was not only used for food but was also rubbed on the body and used for other household purposes.

6.5. Terminology for crafts and craft production

6.5.1. Terms for spinning, weaving, and sewing

Among the principal household occupations of women in the Proto-Indo-European period we can distinguish weaving, ***Hwebh-**, spinning, ***sneH-**, and sewing, ***syu(H)-**. The basic terms connected with weaving and derivatives of ***Hwebh-** were surveyed in Chapter Three above, in connection with wool and its ritual and domestic applications (see II.3.1.4.4–3.1.4.6), and also in connection with the production of flax and hemp (see II.4.2.5).

PIE ***sneH-(i/u)-** ‘spin, weave, bind, braid’: Hom. Gk. *néō* ‘(I) spin’, *nēma* ‘cloth; yarn’, *nēsis* ‘spinning’, Lat. *neō* ‘(I) spin, weave’, MĪr. *sním* ‘spinning’, OHG *nāu* ‘(I) sew’, *nājan* ‘sew’ (Ger. *nähen*), Latv. *snāt* ‘spin, twist’; cognates include formations in *-u-*: Toch. B *šñor*, pl. *šñaura* ‘tendon’, Hom. Gk. *neûron* ‘tendon; bowstring made of ox tendons; cord’, *neurē* ‘bowstring’, Skt. *snāvan-* ‘sinew’, Avest. *snāvarə* ‘tendon’, Arm. *neard* ‘tendon’, OCS *snujq* ‘(I) set warp’

17. A Hittite neuter word for ‘salt’ is concealed behind the Sumerogram *MUN-an*; however, there is also a form of common gender *MUN-aš* (Friedrich 1952:286).

(see Trubačev 1966:90-91, 113).

PIE ***syu(H)-** 'tie, sew, twist': Hitt. *šummanza(n)* 'rope' (Oettinger 1980), Skt. *syūman-* 'band, thong, belt', Gk. *humēn* 'tendon', Skt. *sīvyati* 'sews', Lat. *suō* '(I) sew', Goth. *siujan* 'sew', Lith. *siūti* 'sew', Latv. *šūt* 'sew', OCS *šijǫ* '(I) sew'; possibly also Hitt. *šuel* 'thread' (?) (Friedrich 1952:196).

PIE ***seH(i)-** 'tie, bind; twist': Hitt. *išhiya-* 'tie' (the source of *išhiul* 'treaty'), Luw. *hišhiya-* 'tie' (reduplicated stem), Skt. *syāti* 'binds', 3sg. aor. *āsāt*, Latv. *siet* 'bind', Lith. *siėti* 'bind', *saītas* 'leash', Latv. *saīte* 'binding, tether, string', OPruss. *-saytan* 'strap', OCS *sěti* 'loop, snare, trap', OHG *seito* 'rope, loop' (Ger. *Saite* 'string of musical instrument'); formations in *-m*: Hitt. *išhimana-* 'rope, string', Hom. Gk. *himās*, gen. *himántos* 'strap', Olcel. *sími* 'rope, cord'.

Formal and semantic comparison of ***syu(H)-** and ***seH(i)-** and their derivatives suggests that the two forms are probably related. ***syu(H)-** may be regarded as an ancient zero-grade form with the suffix ***-u-**: ***seH(i)-** > ***sHy-u-**.

6.5.2. *Indo-European terms for clothing and dressing*

A Proto-Indo-European term for clothing and dressing in general can be reconstructed as ***wes-**, reflected in all the major early dialects: Hitt. *wešš(iya)-*, *wašš(iya)-* 'get dressed', 3sg. mediopass. *wešta* (KUB IX 28 I 15), Luw. *waš-*, Toch. A, B *wās-* 'get dressed', Skt. *vāste* 'gets dressed', Avest. *vaste* id., Arm. *z-genum* '(I) get dressed' (from ***wes-nu-**), Hom. Gk. *hénnumi* '(I) dress (someone)', middle '(I) get dressed', Alb. *vesh* 'dress (someone)', *vishem* 'get dressed', Goth. *wasjan* 'dress (someone)', Olcel. *verja* 'dress (someone)'. Nominal derivatives: Hitt. *wašpa-* 'clothing' (Goetze 1955:52-53, Watkins 1969a), Luw. *wašpa-nt-*, Toch. A *wsāl* 'clothing', cf. Olcel. *vesl* 'clothing'; Skt. *vāsana-* 'clothing' (cf. Gk. *heanós* 'women's clothing'), Avest. *vaṇhana-* 'clothing'; Skt. *vāstra-* 'clothing', Avest. *vastra-* 'clothing'; Arm. *z-gest* 'clothing', Gk. *esthēs* 'clothing', Lat. *uestis* 'clothing', Goth. *wasti* 'clothing'.

The stem ***wes-** can be etymologically linked with the primary root ***eu-** (zero grade with suffix ***-es-**) 'put on, pull on' (see Lane 1931:5): Lat. *ex-uō* '(I) undress', *ind-uō* '(I) put on', *ind-uuiæ* 'clothing'; Arm. *aganim* '(I) put on', OIr. *fuan* (from ***upo-ou-no**, Pokorny 1959:346), Lith. *avėti* 'wear shoes', *aūti* 'put on footwear', Latv. *āut* 'put on footwear', OCS *ob-ujǫ* '(I) put on footwear', cf. Avest. *aōθra-* 'footwear'.

There are also a few dialect words which denote individual items of clothing or types of clothing, e.g. Gk. *zōnē* 'belt', *zōstós* 'belted', Hom. *zōstēr* 'warrior's belt', *zōstron* 'belt', Avest. *yāh-* 'belt', *yāsta-* 'belted', Alb. *ngjesh* 'put belt on', Lith. *júostas* 'belted', *júosta* 'belt' and others (see Barber 1975).

6.5.3. The general term for craft production in Indo-European

The Indo-European terminology for handicrafts in the broad sense also includes the stem **theḱh₂s-* ‘produce; braid; work (something)’ (primarily wood with a sharp tool or axe), ‘model (in clay)’. The broad spectrum of meanings reconstructed from reflexes of this stem in the historical dialects suggests that the word collectively designated craft production in general, subsuming carpentry, weaving, pottery, etc.

Hitt. *takš-*, *takkeš-*, *taggaš-* ‘do, make; connect; put together; build; produce’; Skt. *tákṣati* ‘produces, prepares, makes by hand’ (e.g. in the Rigveda *rátham* ‘chariot’, *caṣālam aśvayūpāya* ‘ring of the sacrificial pillar’), past participle *taṣṭá-*, Avest. *tašta-* ‘cup’, cf. Lat. *testa* ‘brick; vessel, pot’; Skt. *tákṣan-* ‘carpenter’, Avest. *tašan-* ‘creator’, cf. Gk. *téktōn* ‘carpenter’, Skt. *táṣṭar-* ‘carpenter’, cf. Lat. *textor* ‘weaver’; Avest. *tašaiti* ‘produces’, ‘(carpenter) makes’, *taša-* ‘axe’ (Pers. *taš* ‘axe’); Gk. *tékhne* ‘handcraft, art, craftsmanship’, Lat. *texō* ‘(I) braid, weave, put together, build’, OIr. *tál* (< **tōkslo-*) ‘axe’, OHG *dehsa*, *dehsala* ‘axe, poleaxe’, MHG *dehsen* ‘scutch hemp, flax’, Lith. *tašyti* ‘hew’, Latv. *tēst* ‘hew, work (wood, etc.)’, OCS *tesati* ‘hew’, RChSl. *tesla* ‘carpenter’s tool; adze’ (Trubačev 1966:152).

6.5.4. Dialect terms for craft production

Another Indo-European stem, dialectally more restricted, is **khoer-*, with approximately the same meaning ‘do, make; connect; make by hand; form’, reflecting an aspect of the productive process common to several crafts: Skt. *karóti* ‘makes, connects, prepares’, *kárman-* ‘handcraft’, *Viśvá-karman-* ‘Master of all trades’ (a deity in the Rigveda), *karmāra-* ‘smith’, Avest. *kərənaoiti* ‘makes, accomplishes’, *čārā-* ‘means, method’, OIr. *cruth* ‘image, form’, MĪr. *creth* ‘poetry’, Lith. *kūrti* ‘make, create’, OPruss. *kūra* ‘builds’. If Hitt. *kuer-/kur-* ‘cut, cut off’ is cognate (Pedersen 1938:128; cf. Friedrich 1952:113), then the stem must be regarded as being of Proto-Indo-European date.

6.5.5. Terms for woodworking

Another Indo-European term having to do with woodworking is **phleḱh₂-* ‘plait, braid, intertwine’:¹⁸ Skt. *praśna-* ‘braiding’, Avest. *frašnəm* ‘braiding’,

18. **phleḱh₂-* may represent State II of the Indo-European root **phel-* ‘put together, fold’ (see Pokorny 1959:834, cf. Watkins 1971:1535): Gk. *di-plós* ‘double’, Lat. *du-plus*, *du-plex* ‘double’ (lit. ‘folded in two’); Goth. *twei-fls* ‘doubt’, OHG *zwīval* ‘doubt’ (Ger. *Zweifel*); Alb. *pālë* ‘fold, pleat’, OHG *faltan* and others. State I of the same root is possibly represented in IE **phelk₂h₂-* ‘twist, turn’: OHG *felga* ‘rim of wheel’ (see I.4.2.2 above on the binomes of Benveniste).

Hom. Gk. *plékō* '(I) braid', Lat. *plectō* '(I) braid, twist, interweave', OHG *flehtan* 'braid' (Ger. *flechten*), *flahs* 'flax' (Ger. *Flachs*), OE *fleax* (Engl. *flax*), OCS *pletq* '(I) braid, plait'.

Another is **ther-* 'rub, polish, abrade; drill, bore hole': Hom. Gk. *teirō* '(I) rub', *térettron* 'drill', Lat. *terō* '(I) rub, grind, sharpen, scrape off/out', OIr. *tarathar* 'borer', OHG *drāen* 'turn' (Ger. *drehen*), OCS *ŭrq* '(I) rub', Lith. *trinti* 'rub'.

PIE **bher-* 'work (e.g. wood, land) with a sharp tool': Avest. *tiži-bāra-* 'with a sharp cutter', Arm. *brem* '(I) dig out, drill (out)', Alb. *boríg(ē)* 'chip', *brimē* 'hole', Gk. *pharōō* '(I) plow', *pháros* 'plow', Lat. *forō* '(I) drill, bore through, make hole through', OHG *borōn* (Ger. *bohren*), OE *borian* (Engl. *bore*), OIcel. *bora* 'drill', Russ. *bort* ' (beehive in) hollow in tree trunk, hollowed-out tree'.

PIE **skher-* (enlarged by various suffixes) 'carve, shear, cut': Skt. *kṛntāti* 'cuts', Avest. *kərəntaiti* 'cuts, flays; cleans, dresses (slaughtered animal)', Hom. Gk. *keirō* '(I) cut, shear', OIcel. *skera* 'cut', OHG *sceran*, OE *sciēran* 'shear, cut' (Engl. *shear*), Russ. *kroju* 'cut out', Polabian *krúōje* 'cuts', OIr. *scara(im)* '(I) separate off'.

PIE **t'ēr-* 'remove skin, bark': Hom. Gk. *dérō* '(I) skin, dress (animal), strip bark', Arm. *teřem* '(I) remove skin, bark', Goth. *dis-tairan* 'tear to pieces', OE *teran* (Engl. *tear*), OHG *zeran*, *fir-zeran* 'tear apart' (Ger. *verzehren*), Lith. *dirti* 'skin, peel, strip off', OCS *derq* '(I) tear off, strip off'.

6.5.6. Indo-European pottery terminology

Words specifically having to do with pottery making are represented in Indo-European by a small number of general terms. Most important is **dheigh-* in the specialized meaning 'clay; material for pottery' and also 'clay structure, clay wall'; as a verb it meant 'mix clay, mold'. All these meanings of the protoform are reflected in the semantics of the words derived from it, found in the historical Indo-European dialects:

Toch. A *tseke* 'sculpture', Skt. *dehī* 'wall (of clay)', *dehayati* 'builds a wall around', Avest. *pairi-daēzayeiti* 'builds a wall around', OPers. *didā-* 'fortress'; Hom. Gk. *teikhos* 'walls, stronghold, fortification, rampart'; Osc. *feihúss* 'walls' (acc.); Lat. *fingō* '(I) mold, shape', *figulus* 'potter', cf. OHG *tegal* 'crucible' (Ger. *Tiegel*), Goth. *daigs* 'dough', OHG *teig* 'dough' (Ger. *Teig*), OE *dāg* (Engl. *dough*).

The absence of any other clearly Proto-Indo-European words for pottery making may be due to loss of the common words for pottery and potting implements in the separate historical dialects and their replacement by new terms (for dialectal pottery terms see Trubačev 1966:173-308); for instance, it

is impossible to reconstruct with certainty a Proto-Indo-European term for the potter's wheel.¹⁹

Words referring to types of handcraft activity are preserved better than words for the artifacts produced. Names not only for shared ceramic articles but also for other craft products are unstable across dialects, evidently due to changing handcraft technology and the appearance of new objects with new names. Under such conditions it is impossible for the researcher to reconstruct to the protolanguage terms found in separate dialects, even though these terms may in fact continue forms which existed in the actual protolanguage. Therefore, even in the absence of a well-developed reconstructible Proto-Indo-European pottery terminology, one can presume a certain level of pottery-making development among the ancient Indo-Europeans, and the corresponding technical devices for producing ceramic items and firing them in kilns. Thus we can assume that certain terms pertaining to pottery which are preserved only in particular dialect groupings may actually reflect words of Proto-Indo-European date.

One such possibly Proto-Indo-European term is Skt. *ukhá-* 'cooking pot', Goth. *aiúhns* 'oven' (cf. OE *ofnet* 'small vessel', OHG *ovan* 'oven', Ger. *Ofen*), Gk. *ipnós*, *hipnós* 'oven', Lat. *aulla*, *aula* 'pot' (see Pokorny 1959:88), supported by Hitt. *ḫappina* 'into the oven' (directive case, Oettinger 1976:29), OPruss. *wumpnis* 'oven for baking bread'.

Another is Vedic Skt. *gharmá-* 'kettle; heat', *ghṛná-* 'heat', Lat. *formus* 'warm', *fornus* 'oven', *fornāx* 'oven', *fornix* 'vault' (evidently one made of pots: Trubačev 1966:199), ORuss. *g"rn* 'kiln, forge'. The Indo-European source **ghoer-* in its original meaning is defined as 'heat, warmth' (Skt. *háras-* 'heat', Gk. *thermós* 'hot', etc.); however, at a fairly early date the word could already have acquired a special technical meaning pertaining to pottery (see Ernout and Meillet 1967:248).

Pottery making arose at an early stage of the Neolithic revolution, and after the seventh to sixth millennia B.C. it spread from southwestern Asia to Europe and eastward to Asia (see Mellaart 1965:86, 105-6, 115ff.).

6.5.7. The terminology of metallurgy. Words for 'copper'

Pottery making was a precondition for the development of smithery and

19. Unless we regard the Indo-European words for 'wheel', **k^hoek^holo-* (Skt. *cakrá-* 'circle', Gk. *kúklos* 'circle', etc.) and **rotho-* (Lat. *rota* 'wheel; potter's wheel'), as words for 'pottery wheel'; both meanings are present in Hitt. *ḫurki-* 'wheel; potter's wheel' (Sumerogram G15DUBBIN), see below. A synchronic generalization can be established in the area of cultural typology: the presence of the potter's wheel can be assumed in cultures which have the wheel (Childe 1954). The indubitable existence of the wheel in ancient Indo-European culture, at least by the time of the breakup, makes it likely that the potter's wheel was also present.

metallurgy (Wertime 1973a). Its required temperatures, on the order of 800°-1000° C, were attained in specially equipped kilns. The smelting of metals could take place in special bowls which isolated the metal from the air and prevented oxidation (Forbes 1955-1964:IX, Aitchison 1960).

For Proto-Indo-European we can reconstruct a number of metal names, which in itself shows that the ancient Indo-Europeans were familiar with certain metals and their use in the household and for making weapons. PIE ***H₂ayē/os-**: Skt. *áyah*, gen. *áyasah* 'metal; iron; iron implement; sword, knife', Avest. *ayah-*, gen. *ayanhō* 'metal; iron', Lat. *aes*, gen. *aeris* 'copper, bronze; copper or bronze article', Goth. *aiz* 'metal coin' > 'money', OHG *ēr* 'ore', OIcel. *eir* 'ore; copper'. Derivatives in ***-no-**: Avest. *ayanhaēna-* 'metallic; iron (adj.)', Lat. *aēnus* 'copper, bronze' (adj.), OE *æren*, OHG *ērīn* 'of bronze'.

The variety of meanings attested in the historical reflexes of ***H₂ayē/os-** — 'copper', 'bronze', even 'iron' — makes it impossible to choose between 'copper' and 'bronze' as proto-meaning on purely linguistic grounds. But copper is typologically prior to bronze, which is an alloy of copper with tin or a substitute for tin;²⁰ this speaks in favor of an original meaning 'copper' for the Proto-Indo-European word. With the appearance of bronze, known in Southwest and Southeast Asia from the fourth millennium on (Forbes 1955-1964:IX; Wertime 1973b:876), the word for copper could have been transferred to bronze, just as later, in the Iron Age (which begins in the late second or early first millennium B.C. in western Asia and India), the same word was transferred to iron in the Sanskrit descriptive term *kṛṣṇāyasa-* 'iron' < *kṛṣṇa-* + *ayas-*, lit. 'black metal' (see Thieme 1964:594).²¹ The shift from 'copper' to 'bronze' could have begun

20. The earliest specimens of copper come from the Middle East, beginning with Çatal Hüyük (seventh to sixth millennia B.C.): Neuninger, Pittioni, and Siegl 1964.

Interesting in this connection are Mesopotamian ritual texts praising the fire (Sum. *gibil*) which mixes copper (Sum. *urudu*, Akkad. *erû*) and tin (Sum. *an.nag*, Akkad. *annaku*): Levey 1959:211. The Sumerian text 'Enki and the World Order' speaks of bronze as an alloy of copper with tin, imported from the eastern country Meluhha, probably India (see Falkenstein 1964:76): Sum. *urudu-zu nanga-zabar(r[a] ḫé-ém)* 'may your (i.e. Meluhha's) copper be (i.e. contain) tin-bronze'. Evidently in Sumerian times bronze containing tin was imported into Mesopotamia from Meluhha. In Sumerian such bronze is sometimes simply called 'Meluhha copper' (*urudu-me-luḫ-ḫa*, Sjöberg 1963:257). An origin for Sumerian bronze in the ancient cities of the Indus Valley was proposed long ago (see Aitchison 1960:I.42-43, 62). Only much later — probably after the destruction of the Indus Valley cities and the breaking of trade relations with India — does tin for producing bronze begin to be imported into Mesopotamia and Asia Minor (*kārum Kaniš*) from the west, in particular from the Iberian peninsula (see Wertime 1973a, b).

21. Skt. *kṛṣṇā-* 'black', with cognates OPruss. *kirsnan*, OCS *črŭnŭ* 'black', Lith. *kėršas* 'black and white (spotted)' (without the suffixal element ***-no-**). The word is a dialect term for 'black', restricted to the Indo-Iranian-Balto-Slavic dialect grouping, see Porzig 1964:247. The same dialect area has a term for 'gray-black', probably a horse color: Skt. *śyāvā-* 'brown-black; bay', Avest. *syāva-* 'black' (cf. the personal name *Siiāuūāspi-*, lit. 'having bay horses': Mayrhofer 1979:I.75), OPruss. *sywan*, Lith. *šyvas* 'gray-white, gray', OCS *sivŭ* 'gray' (Porzig 1954:166 [1964:246]).

There is no Proto-Indo-European word for 'iron'. The words for 'iron' are not cognate and arise only in the separate daughter dialects, which in itself is evidence for the appearance of

fairly early, possibly even in Proto-Indo-European or some of its dialect groupings. It is this process that is reflected in the daughter languages, where along with the usual meaning 'bronze' we also find 'copper'.

6.5.8. Indo-European metal names and color attributes

The Indo-European word for copper or bronze is replaced in a number of daughter languages by loanwords or by extensions of color terms to metals of the same color. For instance, the Indo-European word for 'copper' and 'bronze' is absent in Hittite, where these metals are designated by other terms: Hitt. *kuwanna*- 'copper; precious stone; the deep blue color of copper sulfate crystals', Luw. *kuwanzu*- 'copper' (Laroche 1959a:59) beside Myc. Gk. *ku-wa-no* 'blue glass', Hom. *kúanos* 'blue; copper; steel';²² Hitt. *ḫarašu*- 'bronze' (perhaps a borrowing of Akkad. *ḫurāšu* 'gold'; for the shift in meaning cf. the Finnish borrowing *vaski* 'copper' from Indo-European 'gold', as shown by Arm. *oski*, Toch. A *wās* 'gold', cf. also Sumerian *guškin* 'gold', below).

The Hittite names of other metals used to form alloys with copper in making bronze are based on original Indo-European color terms: Hitt. *dankuli*- 'tin' (originally 'dark', cf. Hitt. *dankui*- 'dark', OHG *tunkal* 'dark', Ger. *dunkel*) and *šuli(ya)*- 'lead', cf. Lat. *liuidus* 'bluish, bluish-gray', *liuor* 'blue color; color of lead', OIr. *lí* 'color, sheen', Russ. *sliva* 'plum' (originally 'dark-colored fruit', cf. Slovene *slív* 'plum-colored, bluish'), OHG *slēha*, Ger. *Schlehe* 'sloe', OE *slāh*, Engl. *sloe*²³ (see Neumann 1957).

iron after the Proto-Indo-European breakup. The first specimens of iron date to the third millennium B.C. (Wertime 1973a:674, 676, 682; 1973b:875, 882). The spread of iron as a smelted metal comes after the twelfth century B.C. (see Coghlan 1956), which agrees with the date of formation of the historical Indo-European dialects and possibly of dialect groupings. The words for 'iron' that arise in these dialects show connections with languages of the Mediterranean and the Near East:

Hom. Gk. *khalkós* 'metal; copper; steel', Myc. *ka-ko* 'metal; copper' (cf. *ka-ke-u*, Hom. Gk. *khalkeús* 'smith'), formally comparable to Balto-Slavic words for iron: OPruss. *gelso*, Lith. *gelžis*, dial. *gelžis* 'iron', Latv. *dzelzs*, OCS *želězo* 'iron'. The dialectal protoform can be reconstructed as **ghelǵh-*, which may be related to the name of a Pontic tribe from Asia Minor, *Khálubes*, known in classical tradition as *sidērotéktones* 'skilled in working metal' (see Piotrovskij 1959:161, Planhol 1963). Also related to these is the Hattic-Hittite word for 'iron', *ḫapalki*- (Laroche 1966), which later entered Hurrian (*ḫabalgi* 'iron') and Akkadian (*ḫabalkinnu* 'iron'); see Diakonoff 1971:79. For iron and ironworking in Anatolia in the second millennium B.C. see also Siegelová 1984.

Lat. *ferrum* 'iron', Gk. *bírrē* (Hesychius) may be related to Akkad. *parzillu* 'iron', Aram. *parzel*, Hebr. *barzel*, Ugar. *brīl* (*bršl*), see Aistleitner 1963:60) 'iron', Svan *berēž* 'iron': see Furnée 1972:232, 251, 252.

22. This word is compared to Sum. KÙ.AN 'sky(-colored) metal' by Halleux 1969.

23. It is often difficult to determine the direction of a semantic shift. In the case of the lexemes at issue here, it is not clear which was the original meaning: was the semantic shift from the color ('dark') to the name of the metal ('lead': Neumann 1957), or from the metal to the color ('dark', 'shiny', i.e. 'with metallic sheen')? The fact that Lat. *liuidus* has the meaning 'lead-

The connection of metal name with color term is especially clear in PIE ***r(e)udh-** ‘red metal, copper’ and ‘red’: Skt. *lohá-* ‘red metal; copper; iron’, Lat. *raudus*, pl. *rūdera* ‘piece of copper; copper coin’, OCS *ruda* ‘metal’ (translating Gk. *métallon*), Russ. *ruda* ‘ore’, USorb. *ruda* ‘iron ore; red earth’, OHG *aruzzi*, *erizzi*, *aruz* ‘ore’, OSax. *arut* ‘ore’, ONorw. *ørtog* ‘one-third value of copper coin’ beside Skt. *lōhita-lrōhita-* ‘red’, *rudhirá-* ‘red’, cf. Toch. B *ratre* ‘red’, A *rtār* ‘red’, Khotanese Saka *rrusta-* ‘red’, Hom. Gk. *eruthrós* ‘red’ (Dürbeck 1977:121ff., cf. *eruthrós khalkós* ‘red metal’, Iliad 9.365), Lat. *ruber* ‘red’, *rūbidus* ‘dark red’, Umbr. *rufru* ‘rubros’, OIr. *ráad* ‘red’, Oícel. *rjóðr* ‘red’, *rauðr* ‘red’, Goth. *rauþs* ‘red’, OHG *rōt* (Ger. *rot*), OE *rēad* (Engl. *red*), Lith. *raūdas* ‘red’, ORuss. *rud* ‘red’ (see Risch 1979).

The dialect distribution of this word in its two meanings ‘ore; red metal’ and ‘red’ clearly shows that both of the historically reflected meanings are of Proto-Indo-European date. Note that the root shows regular ablaut alternations and appears in both full grade (***reudh-**) and zero grade (***rudh-**). The meaning ‘copper’ can be posited for this word both on the evidence of its reflexes in individual dialects (e.g. Sanskrit and Latin ‘copper’) and on the strength of semantics, since red is the typical color of copper and copper ore.

Since, as we have already seen, Indo-European ***Haye/os-** had the meaning ‘bronze’, ***r(e)udh-** must obviously have had the specialized meaning ‘copper’ or ‘red ore, red metal’ — the basic element in the alloy producing bronze.

6.5.9. *The connection between Indo-European and ancient Mesopotamian terms for copper*

PIE ***r(e)udh-** ‘copper’ is extremely close in sound and meaning to Sumerian *urudu* ‘copper’. The Sumerian word may go back to ‘Proto-Sumerian’ **burudu*, which underlies the name of the Euphrates river, Akkad. *Purattu*, i.e. the river where copper ore was smelted (see Limet 1960). In Sumerian the word is generic for several types of copper. Copper metallurgy is known in Mesopotamia from the end of the sixth millennium onwards, with a succession from the Hassuna culture (Tell-es-Sawwan near Baghdad) to the Ubaid culture (4400–4300 B.C.) and early Sumerian culture (Desch et al. 1928–1936, Levey 1959:196–211).

colored’ and OIr. *lf* means ‘sheen’ makes the second direction, from metal (i.e. lead) to color (i.e. dark, shiny like lead), likely. If we make this assumption we can reconstruct a Proto-Indo-European word for ‘lead’ in the form ***sl-i-**, preserved in this meaning only in Hittite and replaced in the other languages by loans like Lat. *plumbum* ‘lead’ (Ernout and Meillet 1967:516), Hom. Gk. *mólibos* ‘lead’, etc. In other Indo-European dialects derivatives of this root appear with the transferred meanings of color and sheen. A connection with the original Indo-European meaning of ***sl(i)-** can be seen in Hom. Gk. *sólos* ‘molten mass of metal’. The preservation of the initial **s-* in Greek can be compared to analogous examples like *sūs* ‘pig’ beside *hūs* (see II.3.2.2.5 above for these forms).

A connection between Indo-European **reudh-* and Sumerian *urudu* was proposed in J. Schmidt 1890 (see Hommel *apud* Pokorny 1959:873). Such a borrowing could have gone in only one direction, from Sumerian to Indo-European (contrary to the proposal of Scherer 1947 for a borrowing in the opposite direction).²⁴ The presence in Proto-Indo-European of a word shared with Sumerian and obviously borrowed from Sumerian raises once again the question of contacts between these languages and connections between the territories where they were spoken.

6.5.10. Indo-European words for silver and their connection with 'white', 'shining'

The Indo-European word for 'silver', **Hark̑-*, is related to the original word for 'white, light-colored': Hitt. *ḫarki-* 'white; silver'²⁵ (cf. Toch. A *ārki-*, B *ārkwī* 'white'), Hom. Gk. *árguros* 'silver' (cf. *argḗs* 'white, blinding'), Arm. *arcat* 'silver', Skt. *rajatá-* 'silver' (cf. *árjuna-* 'white, light-colored, silver-colored'), Avest. *arazata-* 'silver-colored', OPers. *ardata-* 'silver', Lat. *argentum* 'silver', Osc. *aragetud* 'argento', OIr. *argat* 'silver'.²⁶

The existence of a Proto-Indo-European word for silver naturally shows that the ancient Indo-Europeans were familiar with silver and indicates that they may have had silver metallurgy. In contrast to gold, silver only very rarely occurs in the form of nuggets. Silver metallurgy is believed to have existed early in places where silver is found together with lead (Forbes 1950:582-85, 1955-1964:VIII.194-259, Aitchison 1960:I.46-47). Any evidence of a word for lead in Indo-European can be taken as indirect evidence for the possibility that the ancient Indo-Europeans used silver metallurgy. (See also Mallory and Huld 1984.)

24. Borrowing of Sum. *urudu* from Indo-European is precluded by the fact that the Sumerian word is derived from an earlier **burudu*, far removed from the Indo-European form and chronologically inconsistent with it.

25. Cf. Hitt. DINGIRLIM-aš (or *ši-ú-na-aš*) KÜ.BABBAR-i 'silver (probably *ḫarki-*) of the deity', Hoffner 1968:41. For Hittite color terms see Riemschneider 1957.

26. In the Germanic, Baltic, and Slavic languages the Indo-European word for silver is replaced by another term which finds parallels in a number of Mediterranean languages: Goth. *silubr* 'silver', OE *seolfor* (Engl. *silver*), OHG *sil(a)bar* (Ger. *Silber*), OPruss. *sirablan* (acc.) 'silver', Latv. *sidrabs*, *sudarbs* 'silver', Lith. *sidābras* 'silver'; OCS *sīrebro*, *sūrebro* 'silver'. The word can be compared to Basque *zillar*, *zīrar*, *zidar* 'silver' (Tovar 1970:271-72), Arab. *ṣarīf-* 'silver', Hausa *qzuřfa* 'silver', Lyd. *Sībrōi · ep' argurēōi potamōi* 'on a silver river'. This group of words shows more distant links to Kartvelian **werčx̌-*, compared by some scholars to Hurrian-Urartean *uřhu* 'silver' (Melikišvili 1968:126-27, Diakonoff 1971:167). The replacement of the original Indo-European word for 'silver' in Germanic-Balto-Slavic must point to ancient connections between speakers of this Indo-European dialect group and the Middle East. On the other hand, even the original Indo-European word for silver, **Hark̑-*, finds analogs in ancient languages of the Near Eastern area, in particular Caucasian languages: Lak *arcu*, Dargi *arc*, Tabassaran *ars*, Archi *arsi*, Avar *řarac* 'silver' (see Lafon 1933:91-92). The *saem* forms found in the Caucasian languages point to borrowing from a dialect like Aryan.

6.5.11. Indo-European words for gold

The Proto-Indo-European word for 'gold' can be reconstructed as ***Hau-s-/ *Hw-os-**: Lat. *aurum* (from **ausum*, cf. Sabine *ausom*), OPruss. *ausis*, Lith. *áuksas* (from **auskas*); Toch. A *wäs* 'gold', B *yasa* 'gold', Arm. (v)*oski* 'gold';²⁷ it can be compared with Sum. *guškin* 'gold' (Aalto 1959).

In a number of daughter languages the original Indo-European word for 'gold' is replaced by neologisms. For the most part these are related to ***ǵhel-** 'yellow' (cf. Skt. *hári-* 'yellow', Avest. *zari-* 'yellow', Gk. *khólos* 'bile', Lat. *fel* 'bile', OHG *gelo*, Ger. *gelb* 'yellow', etc.): Skt. *híraṇya-*, Avest. *zaranya-*, OPers. *daraniya-* 'gold', Goth. *gulþ* 'gold', OE *gold* (Engl. *gold*), OHG *gold* (Ger. *Gold*), Latv. *zēlts* 'gold', eastern Lith. *želtas* 'golden', OCS *zlato* 'gold'. In Germanic-Balto-Slavic, 'gold' is derived from ***ǵhel-** 'yellow' enlarged by the suffix ***-th-**. In Indo-Iranian we find a stem in *-n-*. In both instances we are obviously dealing with a fairly early replacement of 'gold' in the separate dialect groupings.

In Greek the replacement is by a relatively early borrowing of *khrusós* 'gold', Myc. *ku-ru-so*, from Semitic: Akkad. *ḫurāšu*, Ugar. *ḫrṣ*, Hebr. *ḫārūṣ* (see Masson 1967, Ventris and Chadwick 1973:558).

6.5.12. Relations between metal names and color terms

An analysis of metal names in Indo-European leads to the conclusion that they are closely linked to color terms. Each metal is named for its characteristic color. On the other hand, it is not impossible that color terms themselves arose from words for metals which were perceived according to their typical colors. In any event, analysis of Indo-European metal names makes it possible to set up a system of color-term oppositions correlated with metals: ***reudh-** 'red, dark red' and 'copper'; ***Hark̑-** 'shiny, white' and 'silver'; ***ǵhel-** 'yellow, yellow-green'²⁸ and 'gold'.

The Indo-European system of colors correlated with metals can be considered typologically characteristic of socially evolved types of cultures where the colors had symbolic meanings, associated both with metals and with phenomena of another order, namely social (see below for Indo-European social ranks). For the typology see Krjukov 1968.

27. The Hittite word for 'gold' is concealed behind the Sumerogram KÙ.GI = GUŠKIN 'gold'.

28. For the meaning cf. Gk. *khlōrós* 'yellow-green' (Dürbeck 1977:108), Lith. *želiū* '(I) become green', OPruss. *saligan* 'green', Latv. *zēl* 'become green', OCS *zelenŭ* 'green'.

6.5.13. Smithing terminology

The traces of metallurgy and metalworking among the ancient Indo-Europeans which can be established from lexical data (see also 6.6 below for chariot manufacture) presuppose the existence in Indo-European of general words for 'smith', 'smithery', and smithing instruments (hammer, anvil, etc.). However, we can find only words of wider or narrower dialect distribution, and there are virtually no words pertaining to smithery that could claim to go back to Proto-Indo-European. This can easily be explained by the special significance of smiths and smithing in Indo-European times and a consequent taboo and replacement of a number of general terms for smithing in dialect groups. The terms for smithery, preserved only in individual branches, show no systematic correspondences in other dialect groups and cannot be formally reconstructed for Proto-Indo-European. But each such group of words could in principle reflect the Proto-Indo-European lexicon and go directly back to ancient Proto-Indo-European forms. These considerations give methodological justification for examining some of those dialectal words in an investigation of the Proto-Indo-European lexicon.

One such term is ***k^haHu-**: Lat. *cūdō* '(I) strike, knock, forge, work metal', OHG *houwan* 'strike, cut, forge' (Ger. *hauen*), OE *hēawan* (Engl. *hew*), OIcel. *hoggua* 'beat, hew', OCS *kovq* '(I) forge', Lith. *káuju* '(I) beat, cut, kill'; possibly also cognate are Toch. A *ko-*, B *kau-* 'kill', cf. Toch. A *košta-* 'beat, strike a blow'.

In the same dialect area we find a term for the smithing hammer, also in its mythological meaning as lightning or weapon of the thunder god: OCS *mlatŭ* 'hammer', Lat. *malleus* 'hammer, wooden mallet' and also OIcel. *mjöllnir* 'Thor's hammer; lightning', Welsh *mellt* 'lightning', OPruss. *mealde* 'lightning', OCS *mlŭnĭjŭ* 'lightning'. If Old Hitt. *malatti-* 'battle weapon' (Sommer and Falkenstein 1938:60; see Friedrich 1952:133) is also cognate (it shows complete formal correspondence and is semantically close), then the word is plainly to be considered Proto-Indo-European with the meaning 'implement' in general, and in particular the implement of a smith, deified and turned into a designation of cosmic forces as a result of the Indo-European smith-god cult.²⁹

29. The image of a divine smith who is the god of fire and smithing is found in separate historical Indo-European traditions: Hitt. *Ḫašamili-*, a smith god who lived in the subterranean world, Skt. *Viśvakarman-*, a craftsman or smith god, Oss. *Kurd-alægon*, a smith god, Hom. Gk. *Hēphaistos*, god of fire and forging, Lat. *Volcānus*, god of fire and smithing, OIcel. *Vǫlundr*, a mythic smith. This makes it possible to reconstruct this mythological image for Proto-Indo-European tradition as well. The image reflects the real smith, a master of fire and smithing. Note that, while the names of the smith gods differ among the Indo-European traditions (evidently due to replacement of an original name), the images coincide down to the smallest details: in the Germanic-Greek-Latin tradition the god of fire and smithing is lame and often a dwarf or gnome, and in the three traditions he appears in similar plot motifs (an attempt to rape a goddess or the daughter of a king in Greek and Germanic traditions respectively: see Schrader 1883 [1886:236, 237]).

6.5.14. Names of metal tools in Indo-European: axe and poleaxe

The development of metallurgy and smithing entailed the appearance of a number of metal implements of various types. Yet certain stone implements, in particular stone hammers, survived to coexist with metal implements in the Copper Age. The word for 'hammer' in Germanic is cognate to the word for 'stone': OHG *hamar* (Ger. *Hammer*, Engl. *hammer*) beside OIcel. *hamarr* 'cliff, rock', Gk. *ákmon* 'anvil' beside Skt. *ásman-* 'stone'.

One of the tool types characteristic of the Copper and Bronze Ages is the axe (Childe 1934 [1956:362-63]). PIE **a/odhes-* 'axe, poleaxe': Hitt. URUDU *ateš-*, *atešša-* 'axe' beside OE *adesa*, *adosa* 'adze' (Tischler 1977:I). Possibly also cognate is Skt. *-adhiti-* (in compounds: *sv-ádhi-*, lit. 'good axe', *van-ádhi-*, lit. 'wooden axe': Mayrhofer 1976:III.804), in which case the protoform based on the Hittite-Germanic-Indic correspondences should be reconstructed with a laryngeal following the stop: **a/odhH-es-*.

Another word for 'axe', with the narrower dialect distribution of Greek-Aryan, can be seen in **phelekhu-*: Skt. *paraśú-* 'axe, poleaxe', Oss. *færæt* 'axe' (Abaev 1945:8-9, 1958:I.451), Hom. Gk. *pélekus* 'poleaxe, axe; double-bladed sacrificial knife', Myc. *pe-re-ke-we* (Morpurgo 1963:240). Greek-Aryan **phelekhu-* must be considered a borrowing from Semitic (Akkadian) *pilaḫku* 'axe' (Schmidt 1890) (from Akkad. I: *palāku(m)*, II: *pulluku(m)* 'kill; kill with an axe').³⁰ Importantly, this Semitic word was not borrowed independently by Indo-Iranian and Greek after the separation of the two branches, but while a Greek-Aryan dialect community still existed. The borrowed word subsequently underwent regular *centum* and *satem* development in Greek and Indo-Iranian respectively. The word can thus serve as evidence for a Near Eastern location of the Greek-Aryan dialect grouping.³¹

30. Akkad. *pilaḫku(m)* 'axe' (cf. Syr. *pelkā* 'axe, poleaxe', Mand. *pīlka* id.) must be considered an ancient Semitic formation; it is homonymous to the borrowed Akkad. *pilakk/ḫku(m)* 'spindle' (the source is evidently Sumerian *bala[ḡ]*): von Soden 1972:II.863. That the original meaning of Akkad. *pilaḫku(m)* is 'axe' follows from the etymological connections to other Semitic forms of analogous meaning, and also from the clear correlation of this nominal formation with the Semitic verbal root **p-l-k* 'chop, split apart': Akkad. *palāku(m)* 'slash; kill, destroy' (see von Soden 1972:II.814), Arab. *falaḫa* 'split apart' (this Akkadian verb should not be confused with the near-homonymous verb — evidently of Sumerian origin — *palāku(m)* 'section off a neighborhood; delimit a territory', cf. Akkad. *pilku(m)* 'region, neighborhood'; see von Soden 1972:II.813).

31. A number of investigators are inclined to deny the connection of Greek-Aryan **phelekhu-* with Akkad. *pilaḫku* 'axe' on the grounds that the Akkadian word means 'axe' and not 'poleaxe' (i.e. 'two-bladed axe'): see Porzig 1954:160 [1964:237], Thieme 1953:586-87. However, it must be pointed out that the meaning 'poleaxe' is characteristic only of Gk. *pélekus* and not of Skt. *paraśú-*, and that it arose on Greek soil under the influence of the Cretan two-bladed axe. Since we assume the Semitic borrowing to have been not directly into Greek but into a Greek-Aryan dialect grouping, with subsequent regular separate development of the word in Indo-Iranian and in Greek, the secondary meaning 'poleaxe' of Greek *pélekus* is no grounds for denying the connection of Skt. *paraśú-* and Gk. *pélekus* to Akkad. *pilaḫku*. In this connection, it

The word can be considered a cultural borrowing of the post-PIE period, one which became widely distributed among Asiatic languages. A corresponding word can be found in both Mongolian and Tungusic in the meaning 'hammer' (Poppe 1954).

In the Near East and particularly in Mesopotamia, metal axes, including military and ritual axes, are found from the fourth millennium B.C. on and become widespread throughout the Near East and adjacent areas in the third millennium B.C. (see Childe 1934[1956:243ff.]). In Ashur we find pickaxes which combine the function of cutter mattocks and pick mattocks. Such axes were found in the fourth layer of Gawra and are also attested in drawings on the Naram-Sin stela (ca. 2000 B.C.). It can be assumed that the spread of particular Southwest Asian axe types via a Semito-Akkadian intermediary led to the borrowing of the respective terms in particular Indo-European dialect groups.

6.6. Terminology for transport and conveyances

6.6.1. Metallurgy as a precondition for manufacture of wheeled vehicles

The existence of metallurgy and smithing among the early Indo-Europeans could have been determined from the mere fact that the Indo-Europeans had carriages and wheeled transport, whose manufacture can be solidly established on the basis of linguistic data. The manufacture of wheeled vehicles presupposes a certain stage of metallurgical development, in order to make strong wood-working tools (Childe 1944, 1951; see also Ryndina 1971:7-8).

6.6.2. Indo-European terms for 'wheel' and 'wheeled carriage'

We can reconstruct for Indo-European a well-developed terminology pertaining to wheeled vehicles and their parts. For the general term meaning 'wheel' and 'vehicle' several forms can be reconstructed with a partially intersecting dialect distribution.

PIE **k^hoel-* 'wheel', 'wheeled carriage': OIr. *cul* 'carriage', OIcel. *hvel* 'wheel', OPruss. *kelan* 'wheel', Latv. *du-celis* 'two-wheeled vehicle', OCS *kolo*,

is interesting that another word for 'axe' in a number of Indo-European dialects shows a possible Semitic origin: Lat. *secūris* 'axe, poleaxe', OCS *sekyra* 'axe', cf. Akkad. *šukurru*, Hebr. *seḡōr* 'axe' (Vasmer 1953-II.603 [1964-1973:III.593]).

Opponents of the origin of Greek-Aryan **p^helek^hu-* in Akkad. *pilakku*, who claim a lack of connection on the grounds of semantic differences, in fact are rejecting the connection in view of more substantial reasons of an areal nature. Admitting the connection of the Greek-Aryan and Semitic words would presuppose a Middle Eastern area for the Greek-Aryan dialect group, which is incompatible with the European homeland of the Indo-European tribes adhered to by these scholars.

gen. *kolese* 'wheel', nom.-acc. pl. *kola* 'carriage', cf. Lat. *colus* 'spinning wheel; spun thread'. The word is derived from the verbal base **k^{ho}el-* 'rotate, move': Skt. *cāraṭi* 'moves, wanders, travels by vehicle', Avest. *čaraiti* 'turns', Hom. Gk. *pélō*, middle *pélomai* '(I) move, am located', Alb. *siëll* 'turn, bring'. The link between the meanings 'move' and 'rotate' is understandable if we posit a basic meaning of motion or transportation on wheeled vehicles.

A possibly earlier type of formation from the same root, meaning both 'wheel' and 'wheeled carriage', is the reduplicated **k^{ho}(e/o)k^{ho}lo-*, with sound-symbolic reduplication of the initial consonant:³² Toch. A *kukäl* 'carriage', B *kokale* 'carriage', Skt. *cakrá-* 'wheel' (in the Rígvēda also used of the solar cycle ('wheel') and the yearly cycle), Avest. *čaxra-* 'wheel', Hom. Gk. *kúklos* 'circle, wheel', pl. *kúkla* 'wheels', Phryg. *kíklēn . tēn árktōn tò ástron* 'Big Dipper' (thought of as a cart, cf. ORuss. *kola* 'Big Dipper', lit. 'wheels', Ukr. *Viz* 'Big Dipper', lit. 'cart'), OIcel. *hjól*, *hvél* 'wheel', OE *hweogol*, *hwēol* (Engl. *wheel*), OHG *wēl* 'wheel'.³³

A second word for 'wheel', 'cart' found in another group of dialects, including some (Indo-Iranian, Germanic, Celtic) which also have **k^{ho}ek^{ho}lo-*, is **rotho-*: Skt. *rátha-* 'carriage, chariot', Avest. *raθa-* 'chariot', Lat. *rota* 'wheel, circle, potter's wheel', OIr. *roth* 'wheel', OHG *rad* 'wheel' (Ger. *Rad*), OIcel. *rǫðull* 'sun', OE *rador* 'sky', Lith. *rātas* 'wheel', pl. *rātai* 'wheeled carriage', *dvi-rātis* 'two-wheeled cart' (cf. Lat. *birotus* 'two-wheeled'), Latv. *rāts* 'wheel, carriage'. The word can be traced to the root **reth-*, originally 'run, ride': cf. OIr. *rethim* '(I) run', Lith. *ritù* '(I) roll' (Pokorny 1959:866).

Thus we can posit two words for Proto-Indo-European: **k^{ho}ek^{ho}lo-* and **rotho-*, with the common meaning 'circle; wheel; wheeled cart'; there must naturally have been lexical differentiation in meaning. Subsequently the two words acquired a partly complementary dialectal distribution, with only a few individual dialect groupings (Indo-Iranian, Germanic, Celtic) preserving both words. When both are preserved there is some semantic differentiation: in Indo-Iranian **k^{ho}ek^{ho}lo-* means 'wheel, circle' while **rotho-* means 'carriage, chariot' (with numerous derivatives: Skt. *rathe-ṣṭhā-* 'warrior standing on a chariot', Avest. *raθaēštā-* 'one standing on a chariot', 'warrior', Skt. *rathī-* 'driver, coachman', *rāthya-* 'pertaining to a chariot', etc.). In Germanic, **k^{ho}ek^{ho}lo-* means only 'wheel, circle' while **rotho-* narrows its meaning to the metaphorical senses 'sun', 'sky', etc. ('cart' in Germanic is rendered with

32. For the typology of reduplication in the formation of the term for 'wheel' and 'wheeled wagon' cf. Georgian *borbal-* 'circle, wheel' (from **b^rbar-*, cf. *br-un-av-s* 'rotates, turns'), Hebr. *gūlgāl*, *galgal* 'wheel', Aram. *galgal* 'wheel' (cf. Geo. *gorgal-* 'wheel, circle'), Sum. *gigir* 'war chariot'. The phonetic similarity of the Semitic and Indo-European forms is striking. Sum. *gigir* is phonetically not far removed from these forms, which points to historical lexical connections to be discussed below.

33. The Hittite word for 'wagon' is concealed behind the Sumerogram *GiŠGIGIR* ('war chariot'; dat.-loc. *GiŠGIGIR-ni*, *GiŠGIGIR-ya* (Friedrich 1952:273).

another Indo-European word, derived from **weǵh-*). In Celtic, **khoel-* means only 'cart', while **rotho-* means 'wheel', the reverse of the semantic development in Indo-Iranian.

6.6.3. Words referring to rotation

The semantic group of words yielding derivatives with the meanings 'wheel, circle, carriage' includes the stems **Hwer-th-* and **Hwer-ǵh-* 'rotate, turn; wheel, circle; cart':³⁴

**Hwer-th-*: Skt. *vártati* 'rotates', middle 'spin', Ved. *vartaní-* 'rolling; path', Mitannian Aryan *-wartanna* 'circular track for training horses' (see II.3.1.1.3 above), Sogd. *wrtñ* 'chariot', Oss. *wærdon* 'cart' (Abaev 1949:I.54), Lat. *uertō* '(I) turn over', Goth. *waírþan* 'become', OCS *vrītěti sę* 'turn'.

**Hwer-ǵh-*: Hitt. *hurki-* 'wheel', Toch. A *wärkänt* 'wheel, circle', B *yerkwantai* 'wheel', cf. also Hitt. *hurkel* 'monstrous crime' (etymologically 'pertaining to a wheel', i.e. punishment on the wheel: Imparati 1964:321-24, q.v. for Hittite *hurki-* 'wheel' as a cosmic symbol), OIcel. *vargr* 'criminal; wolf', *vargtré* 'criminal tree; wolf tree' (see II.1.4.4 and II.2.1.1.3n3).

The occurrence of this second word uniquely in Tocharian and Anatolian, distinct from **khoekholo-* and **rotho-* (found elsewhere in Indo-European), points to its dialectal nature in the meaning 'wheel'. Tocharian-Anatolian isoglosses like **Hwer-ǵh-* (and also Hitt. *kašt-*, Toch. A *kašt* 'famine, hunger', etc., see 6.4.7) may testify to a Tocharian-Anatolian dialectal closeness within Proto-Indo-European prior to the separation of Anatolian. The appearance of the word in this dialect area could have led to a redistribution of the original Indo-European bases **khoel-*, **rotho-* with semantic change or complete loss (thus Toch. A *kukäl*, B *kokale* mean only 'carriage' and Toch. A *wärkänt*, B *yerkwantai* mean 'wheel').

6.6.4. The ritual role of the wheel in early Indo-European traditions

For a number of early Indo-European traditions there is a characteristic ritual and mythological role for the wheel and its deification as a symbol of the sun, which was worshipped as a deity. The ritual symbolism of the wheel is quite clear in Old Hittite tradition. The wheel, GišDUBBIN (Hitt. *hurki-*), is a symbol which is worshipped, as shown in the Hittite Law formula *ta hu-ur-ki-in*

34. The initial laryngeal in these forms is justified by comparison to the root **Hwer-* 'fasten, dispose' (see Pokorny 1959:1150-52): Hom. Gk. *aefrō* '(I) lift up, bring up', Lith. *vorà* 'row, line', etc. Further evidence for the initial laryngeal is the related Hittite form *hurki-* discussed below.

ḥa-l[i]-en-zi (§198) ‘and they worship the wheel’. In one variant of the legal formula *A.NA GIŠDUBBIN lamniyat* (KBo III 6 I 36) ‘(he) summoned to the wheel’, *GIŠDUBBIN* ‘wheel’ is replaced by the symbol for the deified wheel, *ḌDUBBIN* (ABoT 62 I 36).

In Sanskrit mythology the wheel (*cakrá-*) is a symbol connected to Indra, who wins (or steals — *muṣāya-*) the wheel of the sun god Surya, e.g. in the Rgveda (I, 130, 9) *sūraś cakráṃ prá vṛhaj jātá ójasā* ‘he, born in strength, tore off the sun’s wheel’. The stolen wheel is Indra’s weapon in a battle with demons (Dumézil 1968:131, Elizarenkova 1972:287, 293).

Analogous motifs are found in Iranian mythology. A lethal weapon, the Heavenly Wheel, figures in the Ossetic Nart epic (see Dumézil 1930:190-99, Albarov 1968, Dumézil 1976:68ff.) and recurs in other Caucasian versions of the Nart epic, e.g. *ǰ’an-č’arx* ‘Cutting Wheel’, ‘Wheel of Fate’ in the Ubykh version (Vogt 1963:233, § 2528). This rolling wheel struck the Narts’ enemies, cutting off their legs above the knees.

The motif of a rolling wheel in battles is echoed in Slavic mythology, in a Slovak tale of how the sun was stolen in winter and freed in spring. The one who frees the sun in the spring proposes to the thief that the two of them turn into wheels and roll down a mountain: the one whose wheel breaks will be the loser (Afanas’ev 1865:I.209). Slavic traditions preserve rites and verbal formulas where the sun is described as a wheel: Polessian *souneńko jest to bolszòje koleso* ‘the sun is a big wheel’ (Ivanov and Toporov 1974:221).

Comparison of Skt. *sūraś cakrá-* with corresponding phrases in Germanic, Celtic, and Slavic languages makes it possible to reconstruct a Proto-Indo-European formula meaning ‘wheel of the sun’ (Schmitt 1967:166-69).

6.6.5. *The Indo-European word for the harness and its parts: pole, yoke, and axle*

In addition to the common words for ‘wheel’ and ‘carriage’, **kʰoekʰolo-* and **rotho-*, individual Indo-European dialects preserve terms for parts of the ancient carriage and harness, which make it possible to reconstruct the Proto-Indo-European terms.

PIE **His-/Hoi-es-/Hois-*: Hitt. *ḥišša-* ‘pole’ (for a carriage; metaphorically, the Big Dipper), Skt. *īṣā* ‘pole’ (e.g. in the Rgveda *ékeṣa-* ‘having one pole’), Hom. Gk. *oíēks* ‘rings on a yoke, which the reins passed through’, *oíēion* ‘helm wheel’ (with semantic transfer), Slovene *oje*, gen. *ojese* ‘pole’, Lith. *ielek(š)tis* ‘shaft of plow’ (with suffix **-el-*).

PIE **dhur-* ‘harness’ (noun and verb) (or perhaps **dhṛ(H)-*, see Mayrhofer 1963:II.111, 1979a:38): Hitt. *turiya-* ‘harness’ (verb), e.g. ANŠE.KUR.RA *tu-u-ri-ya-u-wa-aš* (Hittite Laws, §64, 66, 180) ‘harness horse’, GUD-li *tu-ri-ir*

'they harnessed [them] like bulls' (2BoTU 12 A I 16), GİŞGIGIR *tu-u-ri-ya-an* 'harnessed carriage', Skt. *dhūr-* 'harness', Ved. *dhūr-śád-* 'harnessed' (of a harness animal or carriage: Grassmann 1873:690, Sommer 1949).

PIE ***Hakhs-** 'axle': Skt. *ákṣa-* 'axle', Gk. *áksōn* 'axle' (cf. *ámaksa* 'cart', 'four-wheeled carriage', 'Big Dipper'), Lat. *axis* 'carriage axle', e.g. *axes amurcā unguere* 'grease axles with olive oil', Mlr. *ais* 'axle', OPruss. *assis* 'axle', Lith. *ašis* 'axle', ORuss. and RChSl. *os'* 'axle', OHG *ahsa* 'axle' (Ger. *Achse*), OE *eax* 'axle'.

PIE ***yuk'om** 'yoke': Hitt. *yukan* 'yoke', Skt. *yugá-* 'yoke; pair', Gk. *zugón*, Lat. *iūgum* 'yoke', Goth. *juk* 'yoke', Olcel. *ok* 'yoke', OHG *juch, joch* 'yoke' (Ger. *Joch*), Lith. *jūngas* 'yoke', OCS *igo* 'yoke', Welsh *iau* 'yoke', Arm. *luc* 'yoke' (Ernout and Meillet 1967:327). The word is a derivative of ***yeu-k-** 'connect, join, harness': Skt. *yunákti* 'harnesses, connects', Avest. *yaoj-, yuj-* 'harness', Gk. *zeúgnūmi* '(I) connect, harness', Lat. *iungō* '(I) connect', Lith. *jūngiu* '(I) connect', etc.

6.6.6. The ritual role of the yoke in ancient Indo-European traditions

A number of ancient Indo-European traditions reflect a cultic and mythological function for the yoke (see Kožin 1969:38-39). In a Scythian legend which reflects motifs going back at least to Proto-Indo-Iranian times (Dumézil 1968:446-48, 1976:155ff.), the yoke was one of four sacred objects connected with the origin of the Scythian tribe (Raevskij 1977).

In Rome there were special ancient rites of augury using a yoke (*iuges auspicium*) which point back to a whole theory of mystic properties of the yoke (Dumézil 1966:98). In Rome the yoke functioned as a symbol of the subjugation of enemy troops: there was a rite whereby a conquered enemy was made to pass under a yoke. The same motif, found throughout a wider area of the Near East, appears in Old Hittite tradition in connection with the defeat of an external enemy or punishment of courtiers; for instance, the end of the Hattusilis I text states that he harnessed defeated enemies in a yoke.

The converse of the subjugation image is a metaphor of cutting the knot which joins the yoke to the connecting pole. According to the Phrygian myth of the Gordian knot, which reflects this metaphorical symbolism, the one who cuts the knot will be the future leader of the world.

The Proto-Indo-European time depth of ***yuk'om** 'yoke' and the symbolism connected with it are clear in the metaphorical meaning of the yoke as a unit of measure of space and time. This metaphorical meaning is one which would obviously arise under conditions of developed agriculture using a yoke and animal power for the plow. The yoke and plow form an integral ensemble, as is

reflected in terms such as Avest. *aēša yuyō.səmi* ‘plowshare and yoke with pegs’ (Benveniste 1938:532-34).

The symbolism connecting the yoke with space obviously arose as a metaphorical generalization from the notion of the amount of land that can be plowed by a farmer in a particular time period. On the other hand, the symbolic connection of the yoke with time probably arose as a metaphorical extension of the time period required for plowing a certain amount of land. As a result of this generalization we find meanings connected with the original ***yuk’om** ‘yoke’ such as Lat. *iūgerum* ‘amount of land one team of oxen plows in one day’, OHG *juch, joch* id., Hitt. *yuga-* ‘yearly’, *da-yuga-* ‘two-year-old’ (of an animal), cf. Lith. *dveigys* ‘two-year-old’, Skt. *yugá-* ‘time period’, Ved. *tri-yugá-* ‘taking three time periods’, etc.

Another ancient metaphorical meaning acquired by derivatives of ***yuk’om** was the notion of friend or companion: Skt. *yúj-* ‘companion, comrade; harnessed in the same harness’ (cf. *ayúj-* ‘without a companion, unpaired’), Lat. *coniux* ‘spouse’. This symbolism obviously arose under the influence of the double harness, where two animals (usually bulls) were yoked together: cf. Lat. *bīgae* ‘harnessed pair’, Slovincian *dvjīgø* ‘yoke for two oxen’ (Trubačev 1972:82), and Gk. *ázuks* ‘unyoked, unpaired’, formally identical to Skt. *ayúj-* ‘without a companion’.

PIE ***yuk’om** can be compared to Kartvelian ***uy-el-** ‘yoke’ (Geo. *uyel-*, Mingr. *uyu-*, Svan *ūywa*), explained as a loan from Indo-European (Deeters 1957:390);³⁵ for the metaphorical semantics cf. also Geo. *me-uyel-e* ‘spouse’.

6.6.7. *Other Indo-European words for ‘yoke’ and parts of the harness: ‘strap’, ‘bridle’, ‘hook’*

A word with a meaning similar to that of ***yuk’om** but having a narrower dialect distribution is ***Har-m-**: Myc. Gk. *a-mo* ‘wheel’, Hom. Gk. *hárma* ‘chariot’, OCS *jarīmŭ* ‘yoke’, Lat. *arma* ‘device, equipment’.

A Proto-Indo-European word for ‘strap, bridle’ is preserved in the Hittite-Greek area: Hitt. *išmeri-* ‘bridle’, *išmeriyant-* ‘bridled’, *išmanalla-* ‘groom’, Hom. Gk. *himás*, gen. *himántos* ‘leather thong; straps on which the body of a chariot is hung’.

Another dialectal word pertaining to the technical lexicon is ***Hankh-**: Avest. *aka-* ‘hook’ (for tying horses to a carriage), Skt. *aniká-* ‘hook’, *anikuśá-* ‘hook’, Lat. *uncus* ‘hook; stick with hook’, Hom. Gk. *agkúlos* ‘bent’, Gk. *agkúlē* ‘strap’.

35. The suffix ***-el** in ***uy-el-** ‘yoke’ could have arisen on Kartvelian soil; but compare the Indo-European forms from this root in ***-el**: Skt. *yugalá-* ‘pair’, Hom. Gk. *zeúglē* ‘cover, layer of leather put on the neck of a harness animal so the yoke would not abrade it’, Lat. *Iugula* ‘double yoke as the image of the constellation Orion’ (Scherer 1953:222). The protoform for these words could have been the source of Kartvelian ***uy-el-** ‘yoke’.

6.6.8. Indo-European verbs referring to riding in a carriage

The basic words for the motion of a carriage and for carrying or riding in a vehicle were evidently derivatives of the root **weǵh-* ‘carry (in a vehicle)’: Skt. *váhati* ‘carries; rides’, Avest. *vazaiti* ‘carries, transports’, Gk. (Pamphyl. dial.) *wekhétō* ‘let (him) bring’, Lat. *uehō* ‘carry’ (usually on an animal or carriage), Goth. *gawigan* ‘move’, OHG *wegan* ‘move’ (Ger. *bewegen*), Lith. *vežù* ‘(I) carry’ (on a carriage), OCS *vezq* ‘(I) carry, transport’. A nominal derivative of the same root with *o* grade, **woǵho-*, gives the meaning ‘carriage, cart’: Hom. Gk. *wókhos* ‘carriage’, cf. *okhéō* ‘(I) carry, lead’, OCS *vozŭ* ‘cart, carriage’; nominal derivative in **-n-*: Skt. *vāhana-* ‘riding animal’, Mitannian Aryan *wašanna* ‘racecourse’ (see II.3.1.1.3 above), Sogd. *’nxr-wzn* ‘circle of the zodiac; path of stars’, OIcel. *vagn* ‘carriage, wagon’, OE *wægn* (Engl. *wagon*), OHG *wagan* (Ger. *Wagen*), OIr. *fén* ‘type of vehicle’.

Another word meaning ‘ride (in a vehicle)’ may have been PIE **yaH-* (related to the root **ei-*) ‘go’:³⁶ Hitt. *iya-* ‘go; move by vehicle; go by foot (of troops)’, 1sg. *iyahhari*, 3sg. *iyattari*, 3pl. *iyantari* (an Old Hittite hymn to the sun god who rides out on a chariot harnessed (*turiyan*) with four horses, KUB XXXI 127 I 58-59, reads: DUTU-i šar-ku LUGAL-u-e 4-an ḫal-ḫal-du-u-ma-ri uk-tu-ri iš-tar-na ar-ḫa i-ya-at-ta-ri ‘O Sun God! Great king! You constantly ride [in a chariot] around the four corners of the world’); Toch. A *yā-* ‘go, move’, Skt. *yāti* ‘goes, rides’, *yāna-* ‘path; carriage’, Avest. *yāiti* ‘goes, rides’, Lat. *Iānus* ‘Janus, the god of doors and the new year’ (Dumézil 1966:323ff.), OIr. *á* ‘pole (of harness); carriage’, Lith. *jóti* ‘ride horseback’, Slovene *jāhati* ‘ride (in vehicle or on horseback)’.

6.6.9. Culture-historical data on the spread of wheeled vehicles among the early Indo-Europeans. Vehicles among the Hittites

The presence of vehicles and wheels among the ancient Indo-Europeans, as indicated by the linguistic data, agrees with culture-historical evidence for the presence of wheeled vehicles in each of the ancient Indo-European traditions, beginning with the earliest datable written and archeological materials. In Old Hittite tradition, teams of horses and carts harnessed to horses are mentioned in the Anittas text, which speaks of ‘40 teams of horses’, e.g. XL *ŠI.IM.TI ANŠE.KUR.RAḪI.A*, KBo III 22 Vs. 71 (replaced in one variant by the Sumerogram *GIŠGIGIRMEŠ* ‘military chariots’: Neu 1974:35, 51). Cappadocian

36. Cf. Skt. *émi* ‘(I) go’, 1pl. *imāḥ*, 3pl. *yánti*; Avest. *aēiti* ‘goes’, Hom. Gk. *eĩmi* ‘(I) will go’, 1pl. *ĩmen*, 3pl. *ĩāoi*, 2sg.imper. *ĩthi* (cf. Skt. *ihĩ*, Hitt. *it* ‘go!’), Lat. *eō* ‘(I) go’, 1pl. *ĩmus*; Goth. *iddja* ‘(I) went’, OPruss. *ēū* ‘goes’, OLith. *eimi* ‘(I) go’, OCS *iti* ‘go’ (cf. Russ. *idi* ‘go!’). Cf. also Luw. *iti* ‘goes’ (Laroche 1959a:50); in Hittite, the meaning ‘go’ is rendered by derivatives of this root, *pai-* and *iya-*, which also preserve the meaning ‘ride, go by vehicle’.

tablets from approximately the same time and place mention military chariots (Akkad. *a-na na-ar-ka-ab-tim*, Salonen 1951:45) and light chariots (Akkad. *ḫulilukannum*), and seals on these tablets depict chariots harnessed to horses (Childe 1954a:11-12). In Hittite, the corresponding word for 'light chariot' appears in the form *GIŠḫulukanni-*, *GIŠḫulukanna-* (Friedrich 1952:74, Kammenhuber 1961:10); the word is assumed to be a borrowing into both Akkadian and Hittite from a third source, possibly Hurrian.

Later Old Hittite texts mention special heavy sleeping wagons used for resting and overnight stops, and evidently covered: e.g. in the bilingual Hattusilis I annals (ca. seventeenth century B.C.): III *GIŠGIGIRMEŠ MA.AD.NA.NU* 'three sleeping chariots for overnight stops' (KBo X 2 Vs. 1), corresponding to the Akkadian phrase III *GIŠma-ya-la-ti*, lit. 'three beds' (see Imparati 1965:60, Saparetti 1965:77). It is interesting that in the Hittite part the word for 'sleeping wagon' is rendered with the Sumerian logogram for 'wagon', *GIŠGIGIR*, plus the Akkadian determiner meaning 'bed, sleeping place', *madnanu*, translating the Hittite word or phrase with this meaning; in the Akkadian part the equivalent to Hittite 'sleeping wagon' is *mayyaltu* 'bed', evidently because Akkadian lacked a special word for 'sleeping wagon'.³⁷

The same bilingual Hattusilis I annals (KBo X 2 11 Rs. 7, 25ff.) contain the earliest mention of a heavy wagon for carrying loads: the Sumerogram *GIŠMAR.GÍD.DA*, identified with Hittite *GIŠtiyarit-* in the Kumarbi epic, a word possibly of Hurrian origin (Friedrich 1952:224, Güterbock 1946:76ff., Kammenhuber 1976).

The close relationship between the Hittite carriage types *GIŠGIGIR* and *GIŠMAR.GÍD.DA* can be established from the ritual text 512/i Rs. 2-6 (Otten 1958:129), which opposes two *GIŠGIGIR*⁷¹ carriages harnessed with horses (ANŠE.KUR.RA) to two *GIŠMAR.GÍD.DA* carriages harnessed with bulls (GUDḪI.A). *GIŠGIGIR* was a light two-wheeled chariot harnessed with horses and used for military and ceremonial purposes and for ceremonial competitions, while *GIŠMAR.GÍD.DA* was a heavy four-wheeled wagon usually harnessed with bulls and used for pulling loads (see Salonen 1951:40, Otten 1958:130, Kammenhuber 1961:30). The heavy wagon *GIŠMAR.GÍD.DA*, with a pole (*ḫišša-*) and four wheels (IV *ḫurkiuš*), was identified by the Hittites with the Big Dipper, KUB XXXIV 16 II 10; KUB VIII 14 Rs. 8, 10, 12 et pass.

Military chariots harnessed with horses, and their harness *išmeriyaš* (cf. *išmeri-* 'bridle'), are mentioned in the Middle Hittite annals of Tudhaliyas (KUB XXIII 11 II 34-35): 10,000 ERÍNMEŠ Û VI ME ANŠE.KUR.RA *GIŠGIGIRMEŠ* [LÚ.MEŠ]*iš-me-ri-ya-aš* BE.LUḪI.A-*uš* URUK Û.BABBAR-*ši u-wa-te-nu-un* '...10,000 infantrymen and six hundred military chariots har-

37. The inscription of Idri-Mi from Alalakh (ca. sixteenth century B.C.), mentioning an overnight stop in a wagon, uses the term *šillu* 'shade; curtain, covering', which is interpreted in this context as 'covered wagon' (Littauer and Crouwel 1974:31).

nessed with horses, together with their harnesses and military leaders, I brought to Hattusas’.

In Hittite tradition, military chariots function in mythological contexts as the means by which the Sun makes its rounds of the earth. A Middle Hittite hymn to the Sun reads: *nu me-e-u-uš ku-i-uš DUTU-uš tu-u-ri-ya-an ḫar-ši... DUTU-i šar-ku LUGAL-u-e 4-an ḫal-ḫal-du-u-ma-ri uk-tu-ri iš-tar-na ar-ḫa i-ya-at-ta-ri* (KUB XXXI 127 I 52, 58-59) ‘and the four (horses) which you, Sun, harnessed... O Sun God! Great king! You constantly ride [in a chariot] around the four corners of the world’. Later the same text mentions *DṬurešgala-* ‘Divine Groom’ (i.e. the one who harnesses animals; cf. *turiya-* ‘harness’ (verb)).

The ritual function of the two types of Hittite carriages is also evident in royal burial rites.³⁸ The light chariot *GiŠGIGIR*, also called ‘sitting chariot (chariot for sitting in)’ (*GiŠGIGIR ašannaš*, cf. the opposed ‘chariot for lying in’, *GiŠGIGIR MA.AD.NA.NU*, discussed earlier in this section), is used for ‘seating’, i.e. carrying, an image (*ALAM*, Hitt. *ešri-*) of the deceased (*GIDIM*, Hitt. *akkant-*):

na-aš-ta ALAM É-ir-za pa-ra-a ú-da-an-zi na-at-ša-an ANA GiŠGIGIR a-ša-an-na-aš a-še-ša-an-zi (KUB XXX 19+20+21+22 Vs. I 6-7)
‘and they bring the image out of the house and they seat it in the sitting chariot’

The image of the deceased is carried in this chariot to a tent (*GiŠZA.LAM.GAR*), taken out of the chariot (*IŠ.TU GiŠGIGIR ašannaš katta danzi*), brought into the tent, and seated on a golden throne (*GiŠGU.ZA GUŠKIN ašešanzi*), after which a sacrifice is performed. In contrast to the deceased king’s image, his remains are put in a heavy wagon (*GiŠMAR.GÍD.DA*) and carried to the place where corpses are burned (*ukhuri-* ‘eternal fire’): Otten 1958:52, 88, 129.

6.6.10. Wheeled carriages in Southwest Asian burial rites

Burials with four-wheeled carriages or parts of them (such as parade canopies) are found throughout a broad area of the ancient Near East, which shows that the use of carriages in the royal burial rite has ancient roots. Such burials, with four-wheeled carriages harnessed to bulls, are found in Sumer and Elam in the

38. The lightweight chariot, *ḫuluganni-*, functions in an archaic Hittite ritual as a symbol of royal power: *LUGAL-u-e-mu ma-ni-ya-aḫ-ḫa-en GiŠḫu-lu-ga-an-ni-en GiŠDAG-iz a-ru-na-za ú-da-aš* (KUB XXIX 1 I 23-24) ‘to me, the king, the Throne God brought [my] rulership — a chariot — from beyond the sea’ (see Neu 1974:125).

first half of the third millennium B.C. (see Piggott 1969:272, Masson 1973:108). Sumerian depictions of the burial rite from the early dynastic period show a two-wheeled chariot with a pole and yoke, harnessed to horses or onagers, with a standing human figure, evidently an image of the deceased (Childe 1934 [1956:231], fig. 84). This is in striking accord with the ancient Hittite burial rite reconstructed from ritual texts.

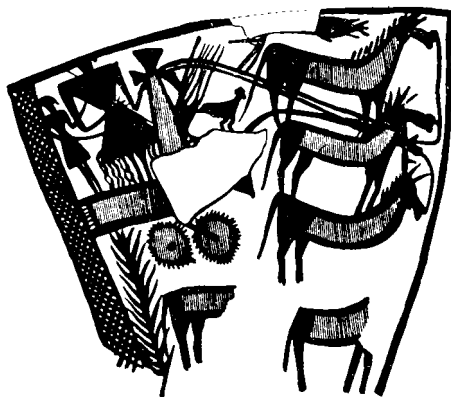


Illustration 15.
Sumerian depiction of a burial rite with chariots

Burials of this type, somewhat later than the early Sumerian ones, are found in Alaca Hüyük in Asia Minor, where royal burials with carriages have been reconstructed (Mellaart 1965:31, 1966:155). At the northern periphery of the Near Eastern area, at a time period roughly synchronous with Anatolia (second half of the third millennium), we find burials of tribal leaders in wooden chariots. This rite is found both in the North Caucasus (Maikop) and in the Transcaucasus (Bedeni, Georgia): Kušnareva and Čubinišvili 1970:166, Masson 1973:104. In the first half of the second millennium B.C., a time contemporaneous to the Old Hittite culture, the combination of cremation with the same burial rite using a four-wheeled carriage is characteristic for the Kurgan culture of Trialeti (see Kuftin 1941:63-100, Piotrovskij 1955:6, Gegešidze 1956:21ff., Džaparidze 1969:270).

6.6.11. Wheel, charioteer, and wheeled carriage in Indo-Iranian tradition

Indo-Iranian tradition in its three oldest forms — Mitannian Aryan, Sanskrit, and Old Iranian — reveals the cultic and military significance of the chariot

with particular clarity in numerous passages from early texts and in the data of material culture. In Mitannian Aryan we can distinguish a term for a separate caste of *maryannu*, attested in sources from Ugarit, Alalakh, Boghazköy, and Tell el-Amarna (see Kammenhuber 1961:20). The word is etymologically related to Sanskrit *mārya-* 'young man; man as member of a cult society' (Grassmann 1873:1010), and is assumed to have acquired the meaning 'charioteer' in Mitannian Aryan (see Mayrhofer 1966). In Ugarit it refers to members of a social group who received land from the king and horses, carriages, and weapons from the royal stables and storehouses (Diakonoff 1972:114); cf. Hurrian *mariyanardi* 'high social rank' (one whose origin was linked with horses and wheeled carriages). Seals of Mitannian kings with Aryan names include depictions of military chariots (Kammenhuber 1961:10). In documents from the Kassite period in Mesopotamia we find Hurrian words for chariots, including *kešhi* (Laroche 1978:133), lit. 'chair' (the semantics is supported by the Hittite 'chariots for sitting in'). It is also interesting that the Akkadian foreign words of the Kassite period include *sakrumaš* 'charioteer; driver of military chariot' (von Soden 1972:II.1013, Edel 1976:78). This Kassite word appears to be comparable to Indo-Iranian words for 'wheel': Skt. *cakrá-*, Avest. *čaxra-*. Since Kassite has taken a number of words from Indo-Iranian, the similarity of *cakrá-* and *sakr-umaš* can be explained by their possible historical connection.

The Rigveda reflects very distinctly the cultic and mythological role of the horse-drawn chariot and the wagon drawn by bulls. The Rigveda (VI, 47, 26-28) and the Atharvaveda (VI, 125, 1-3) preserve an archaic hymn to a war chariot, which is called 'divine' and is an object of worship: *déva ratha práti havyā gr̥bhāya* 'O divine chariot, accept the sacrificial libations' (RV VI, 47, 28).

These chariots were made from the wood of a particularly strong forest tree, *vānas-pāti-*, lit. 'master of the forest', 'chief one in the forest'. In the Rigveda this same compound refers to the strongest part of the chariot, possibly the axle (Grassmann 1873:1208). This was the source of the chariot's power: *vānaspātibhyaḥ páry ābhṛtaṁ sáhaḥ* 'from the chief trees (its) power was brought' (RV VI, 47, 27). The wooden parts of the chariot were bound together with straps of cowhide: *góbhiḥ sām̐naddho asi* 'you are bound with cows' (RV VI, 47, 26).

The manufacture of chariots (*rátha-*) from wood was referred to by the verb *takṣ-* 'make by hand; make': *rátham tákṣan* 'they made a chariot' (RV I, 20, 3 et pass.). This compound of native Indo-European words (cf. Skt. *takṣ-*, Gk. *tekt-*, Hitt. *takš-*, see 6.5.3 above) may reflect Proto-Indo-European usage.

In the hymns of the Rigveda these war chariots are usually ridden by gods, who compete and battle with each other.

This horse-drawn chariot was driven while standing up. This technique,

reflected in the Rigveda, is fairly old and goes back at least to the Proto-Indo-Iranian period: cf. Skt. *rathe-ṣṭhā́*- 'one who stands in a chariot; charioteer' beside Avest. *raθaē-štā́*- id. The Indic and Iranian forms coincide in every detail, down to the locative case of the first element (Hauschild 1954:261).

In its function, construction, and use of horses, the Indo-Iranian **ratha*- corresponds to Old Hittite *GIŠGIGIR* 'war chariot'.

Another type of vehicle, a wagon used for hauling loads, is referred to by the word *ānaḥ* in Indic (cognate to Lat. *onus* 'load, burden': Mayrhofer 1956:I.33). These wagons were drawn by cows or bulls, and were ridden by women as well as men (see Scheller 1975). In the Rigveda, this word is used to refer to the carriage of the goddess Ushas, which was destroyed by Indra: *āpoṣā́ ānaṣaḥ sarat sāmpīṣṭād āha bibhyūṣī ní yāt sīm ṣiṣnáthad vṛṣā́* 'Ushas was running away from the broken carriage in fear when the bull ran into her' (RV IV, 30, 10; see Elizarenkova 1972:121).

Skt. *ānaḥ* 'heavy wagon for carrying loads, drawn by cows or bulls' is functionally comparable to the Hittite cargo wagon, *GIŠMAR.GÍD.DA*, which was drawn by bulls. Just as in Hittite royal burials the remains of the deceased were carried to the funeral pyre in a wagon drawn by bulls, so in Sanskrit tradition a wagon bearing the deceased was pulled to the funeral pyre by cows. This was followed by a rite purifying the cows (see Elizarenkova 1976:253, 379).

6.6.12. Covered wagons among the Indo-Iranians

There is one more striking coincidence between Old Hittite and early Indo-Iranian types of vehicles: covered sleeping wagons intended for long-term inhabitation and overnight stops. For Sanskrit, the existence of such sleeping wagons can be reconstructed from an analysis of legends about 'palace wagons of the gods' (Hertel 1931:277), and also from the use of Skt. *ānar-viś*- 'one who lives in a wagon (*ānaḥ*)' in the Rigveda. The same conception underlies a Vedic hymn which contains the expression *grhó yāmi āramṛkṛto* 'I ride in a well-furnished house' (RV X, 119, 13; see Hauschild 1954:285, Elizarenkova 1972:394).

It has long been claimed that these Sanskrit conceptions reflect the lifestyle of the Aryan nomads at the time when they entered India (Hertel 1931:279).³⁹ Covered wagons can be assumed not only for the ancient Indo-Aryans, but for a broader range of Indo-Iranian peoples, as is shown by archeological finds of

39. This claim is also supported by the analysis of Skt. *vandhūra*-, which is interpreted by the Indian authors themselves as *rāhanūḍa*- 'chariot nest', i.e. the internal part of a covered wagon, where the driver sat. The word *vandhūra*- is etymologically interpreted as 'wickerwork' (from PIE **wendh-* 'weave, plait': Goth. *wandus* 'withe', *-windan* 'weave, plait', etc.): Hauschild 1954:260-62. Wickerwork formed the top of a covered wagon.

terracotta figurines of Scythian covered wagons from Kerch and by the testimony of ancient authors, according to whom "here also the Scyths live, who are called nomads because they have no houses but live in wagons. The smallest of these wagons are four-wheeled, the others are six-wheeled. They are covered with felt and built like houses, some like double houses and others like triple houses. They give protection from water, snow, and storms. These wagons are drawn by harnessed bulls, sometimes two and sometimes three bulls, without horns. They have no horns because of the freezing temperatures. Only women live in these wagons; the men ride horseback" (*Corpus Hippocraticum*, apud Schrader/Nehring 1929:II.616-17).

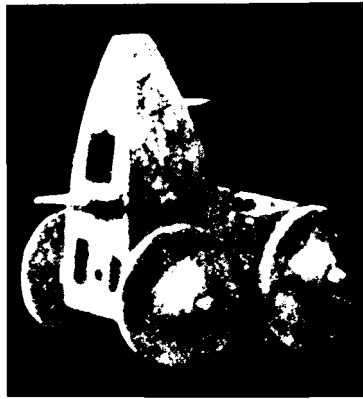


Illustration 16.
Scythian wagon with covered top. Kerch

These covered mobile houses are also found in other archaic Indo-European traditions, in particular Balkan ones, where in mountainous regions there are mobile houses pulled by bulls. That wagon dwellings must have been known to the ancient Germanic tribes is inferable from the fact that houses were classified as movable property in early Germanic law. On the basis of these and similar facts it has long been assumed that covered wagons used as mobile dwellings were an Indo-European phenomenon, and that in such wagons the Indo-Europeans spread to settle their historical territories (Hauschild 1954:278).

6.6.13. Wheeled vehicles and chariots in ancient Greek tradition

In Greek tradition beginning with the Mycenaean period, the wagon and chariot are the main form of military and domestic transport (see Kožin 1966, Lejeune 1968). In Mycenaean Greek the very word for 'chariot', *i-qi-ja* (= Gk. *híppios*),

points to a horse-drawn chariot. Another type of wheeled carriage, *wo-ka* (corresponding to Gk. *wókh-os* and descended from PIE **woǵh-o-*), was a wagon, evidently drawn by mules (Wyatt 1970:100).

Certain parts of the chariot are described in Mycenaean inventory lists as *do-we-jo* (= **dorwejos*) 'wooden'. A tablet from Pylos (PY Vn 10) enumerating chariot parts mentions *du-ru-to-mo* (= Gk. *drutómoi* 'woodcutters') who prepared the wood needed for manufacture of the wooden parts of the chariot (*a-mo-te-jo-na-de*): Wyatt 1970:102; cf. also the word for 'chariot' or its parts, *a-mo* (= [*h*]ar-mo), which corresponds to Gk. *háрма* 'chariot'. Another part of the chariot was called *a-ko-so-ne*, comparable to Gk. *áksones* 'axles', a word with a clear Indo-European etymology (see 6.6.5 above).

The widespread use of war chariots in Mycenaean Greece can also be assumed from depictions in frescoes, seals, vase paintings, and terracotta figurines. There is a distinct uniformity of type in the war chariot and the harnessing of its horses throughout the entire Mycenaean Greek culture area (Blavatskaja 1976:69).

The Mycenaean tradition of using war chariots is preserved in Homer, but even here it is only a vestige of the earlier wide use of war chariots, subsequently replaced by horseback riding for military purposes (Greenhalgh 1973, Hill 1974; for Homer see Webster 1958:103-4).

In Greek tradition going back to the Mycenaean period, there is a conspicuous absence of heavy cargo wagons or clear traces of covered wagons, both so characteristic of the ancient Hittite, Indo-Iranian, and other cultures and representing a probable continuation of Indo-European traditions. These wagons would have been indispensable for the mass migration of Indo-European tribes over dry land and their resettlement in their new territories. They may have been lost in Greek due to particular migratory routes taken by the ancestral Mycenaeans to their historical settlements on the seacoast.

Still, Greek tradition, like other Indo-European traditions, preserves the ancient symbolism of the wheel and horse-drawn chariot for a long time; an example is the image of the sun god Helios who rides on such a chariot (see Frejdenberg 1936:211).

6.6.14. *The ritual role of the chariot in Ancient European traditions*

A displacement of horse-drawn war chariots to an exclusively ritual sphere, as in later Greek tradition, is attested in a number of historical Indo-European traditions. In Rome in particular, the chariot is a relic, preserved as a means of transport only in cultic competitions (Dumézil 1966:212). From Gaulish we have terms for a two-wheeled war chariot, *essedum*, and a four-wheeled riding carriage, *rēda*.

In other Indo-European traditions (Germanic, Illyrian, some Celtic, and others), the existence of both lightweight horse-drawn war chariots and heavy wagons can be reconstructed from cultic depictions and funeral chariots. Four-wheeled ritual and funeral wagons from late Hallstatt and early La Tène times include a four-wheeled ritual wagon from the Dejbjerg swamp in Jutland (Clark 1952:304-5 [1953:302], fig. 168). Urns with cremated remains, or uncremated corpses, are assumed to have been carried to burial places on such wagons. A depiction from Ödenburg (Hungary; Clark 1952:305 [1953:302], fig. 169) of a four-wheeled wagon of this type drawn by two horses shows an urn or image standing on the wagon. A significant number of bronze burial urns standing on wooden wagons have been found, as well as other cultic depictions of four-wheeled wagons (Schuldt 1954:61, fig. 49 et pass.).

Also connected with burial rites is a depiction of a light war chariot of the Mycenaean type, found on a stone slab in a burial place in southern Sweden (Clark 1952:306 [1953:303], fig. 170). A horse-drawn chariot of the same type, carrying a solar disc, was found at Trundholm (Hahne 1910:39, fig. 47). We must assume that the use of these chariots to carry the deceased (or their images and urns after cremation) to the burial place spread westward to central Europe from western Asia (Childe 1950:222, Clark 1952:304 [1953:301-2]).

6.6.15. Horseback riding

The displacement of war chariots to an exclusively cultic function in Central European and late Greek traditions⁴⁰ can be explained by the spread of horseback riding, which replaced the use of chariots for military purposes. Horseback riding arose in the steppes of Central Asia to the east of the Volga. The earliest archeological evidence for horseback riding dates to the fifteenth century B.C. (K. Smirnov 1961, Sulimirski 1970:275). But the refinement and variety of its features at that time point to a long period of previous development (Merpert 1974:115, Kovalevskaja 1977) and hence to an origin at the turn of the third and second millennia or even earlier. The practice of horseback riding could have arisen in this area and subsequently spread westward to reach Europe in the first millennium B.C.

The eastern Asiatic origin of the word for 'riding horse' in a number of Germanic and Celtic languages of Europe is of particular interest in this connection. The word is **mar-kho-*: OIcel. *marr* 'horse', OHG *marah* 'horse', OE *meorh* 'horse', OIr. *marc*, Welsh *march* 'horse', etc. (see II.3.1.1.11 above). It could have been speakers of Ancient European dialects who became ac-

40. The existence of heavy cargo wagons, evidently drawn by bulls, in prehistoric Europe can be assumed from ethnographic data, although the archeological material reflects only the cultic function of such wagons (Clark 1952:303ff. [1953:300ff.]).

quainted with horseback riding while living adjacent to Central Asian tribes and brought with them the practice of horseback riding, together with the word for 'riding horse', to their historical habitats in Europe.

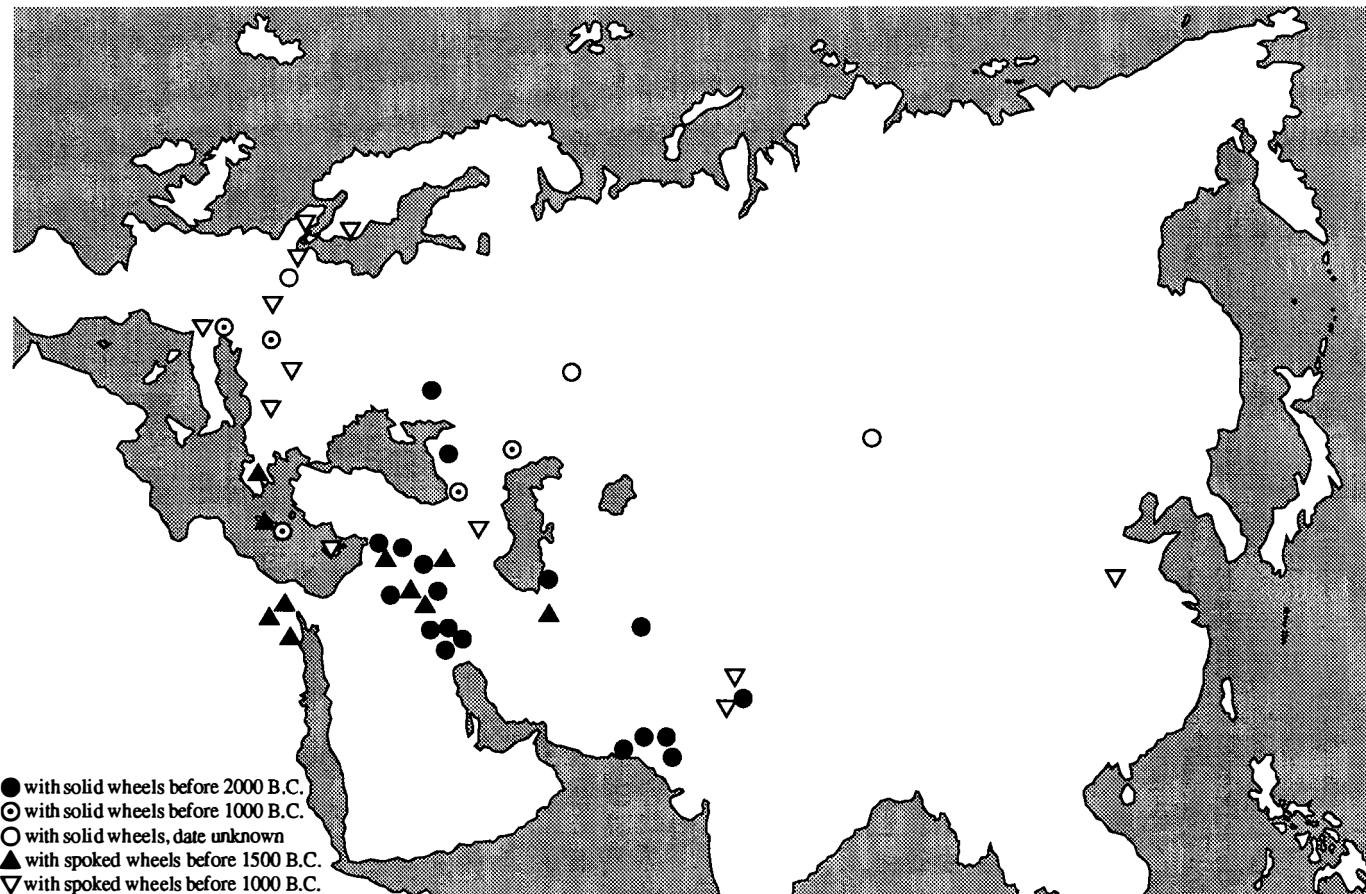
6.6.16. Southwest Asia as the earliest location of wheeled vehicles. Paths of dispersion of chariots to Eurasia

The earliest evidence for wheeled wagons and chariots comes from the Near East (Childe 1951, 1954; Piggott 1968, 1969, 1974). It dates back to the fourth millennium B.C. and consists of pictograms from archaic strata at Uruk (Mesopotamia) depicting dwellings on wheels, evidently four-wheeled sleeping wagons. Later, from the beginning of the third millennium, the same region (Kish, Susa, Khafaje) yields drawings and figurines of wheels and wheeled wagons. Finds in southern Turkmenia (Anau) are connected to these ancient images.

By the middle of the third millennium, the number of finds increases in Mesopotamia and also at Mari on the middle Euphrates. In the second half of the third millennium, the distribution of wagons expands significantly: they are found to the east at Mohenjo-Daro, in the Caucasus (Bedeni in Georgia; Maikop and Elista in the North Caucasus), in the northern Black Sea region, and on the Danube in Hungary (Kalic 1976). This is the approximate date of the northeasternmost find of a horse-drawn wagon — a one-piece wheel from such a wagon — in the Ural area (Gerasimovka, to the east of the Volga: Merpert 1974:94, 115).

At about the turn of the third and second millennia we find chariots in Crete, in western Europe (Hesse), and much farther to the north on the Volga, in the vicinity of Kazan. Chariots from Trialeti (Kuftin 1941, Džaparidze 1969) and Austria date to the first half of the second millennium; chariots from Lčšašen (Lake Sevan, in Armenia) date back to the middle of the second millennium (Piotrovskij 1959:153; see also Littauer and Crouwel 1977). By the end of the second millennium B.C. chariots had reached northern Italy, and drawings of them are attested in southern Siberia and in fortune-telling oracles in China of the Shang period (see Childe 1954).

This overview of the distribution of wheeled wagons suggests diffusion from a center of development, which must be located within the northern part of the Near East. The Near Eastern center of diffusion could only have been an area rich in mountain forests, which were necessary for obtaining hard types of wood; it must also have been an area with a bronze metallurgy sufficiently developed to produce the tools without which it would have been impossible, or extremely difficult, to work hardwoods. The candidates for such a center in the Near East are areas of northern Mesopotamia, on the upper Tigris or to the east



Map 1.
Distribution of wagons in Eurasia (after Childe 1954:15)

of it (Childe 1951, 1954), or the area from the Transcaucasus to northern Mesopotamia, centered between Lakes Van and Urmia (Piggott 1968, 1969, 1974, 1979; see also Šer 1980:198ff.).

The remains of chariots and wheeled wagons found outside of Southwest Asia — Gerasimovka in the Volga-Ural area, the northern Black Sea area, the Balkans, central Europe — must thus be considered as having been brought into these regions from the Near East as a result of migrations by the tribes who settled there. Further evidence for this is the chronological stratification of wheeled wagons, whose earliest Southwest Asian exemplars date to the late fourth or early third millennium B.C., while those found outside this area are more recent in proportion to their distance from the center of diffusion (for instance, chariots found in various parts of Europe date back to the second or first millennium B.C., while those found in the Balkans and the Black Sea area date back to the third millennium).

The penetration of chariots from Southwest Asia to the northern Black Sea area and the Balkans could have been via Asia Minor to the Balkans (see Kalic 1976) and via the Caucasus to the northern Black Sea area (see Piggott 1968, 1969) and then further to western Europe. However, the possibility of a more easterly diffusion route, to the northern Black Sea area via the region east of the Caspian, cannot be ruled out. Evidence for this eastern diffusion route includes the traces of a wheeled wagon in Gerasimovka to the east of the Volga and the penetration of chariots and wagons far to the east, to southern Siberia (the Minusinsk basin of the Karasuk culture period: Novgorodova 1970, 1977:131, Vajnštejn 1975) and China, by the middle of the second millennium B.C.

Chariots in China of the Yin/Shang period (mid-second millennium B.C.) are an innovation brought in ultimately from the Near East. The Yin chariots, in their overall type and that of their bronze parts, yoke, and harness — like the similar Karasuk chariots — reveal an obvious origin in Southwest Asian models (Kožin 1969, 1977, Piggott 1974). There is a striking similarity in the imperial burial cult which involved burial of a chariot and horse together with the deceased emperor (as well as people and sacrificial animals): see Vasil'ev 1976:283-84, Masson 1973:108.

These facts can be added to others, such as the shared mythological image of the chariot of the sun drawn by sacred horses⁴¹ and cosmic images of the chariot, for instance the Big Dipper seen as a chariot (Yuan Ke 1965:122). All

41. The same image of the horse-drawn chariot of the sun is found in ancient Egyptian mythology of the Amarna period (mid-second millennium B.C.). The oath of pharaoh Akhnaten to the sun mentions the horse-drawn chariot of the sun which travels around the earth in all four directions of the compass. This image is regarded as having been brought to Egypt together with other conceptions of wagons and horses (for which see Deines 1953). These Egyptian conceptions are ultimately linked to Indo-European influence, which reached Egypt from Syria and Anatolia (Deines 1953:6), in particular through the Hurrians (Weippert 1975). It is also interesting that similar views of horses as having put the sun in place and of chariots of the sun are reflected as elements foreign to ancient Hebrew culture in books of the Bible (McKay 1973).

of these considerations give grounds for assuming an Indo-European origin for the Yin chariots and for wheeled wagons in general (see Pulleyblank 1966:30ff., 1975:507, L. Vasil'ev 1976:275-79).

Between the concrete Central Asian finds of chariots (Anau, which at the beginning of the third millennium B.C. was the extreme eastern point in the ancient area where chariots were used) and the Yin and Karasuk chariots descended from Southwest Asian wagons of the same type lies a vast territory, with finds of chariots whose chronology is not yet clear but which may date to the second millennium B.C. (Kožin 1968, 1969:40). The best explanation for the lack of clear intermediate links is insufficient study of Bronze Age sites from this territory.

The same explanation applies to the lack of intermediate links between the easternmost chariot finds in the Volga-Ural area (Gerasimovka) and the Central Asian finds. Intermediate finds could flesh out the picture of the expansion of chariots and wheeled wagons to the northern Black Sea region as well as eastward across Central Asia.

Of particular interest in this connection are rock drawings of wheeled wagons and horses found in great quantities along our proposed route of chariot and wagon expansion, from their center of diffusion in the Near East eastward to Central Asia and further to the northeast. Rock drawings of horse-drawn wheeled wagons, dated to the Bronze Era (third to second millennia B.C.), have been found in an area stretching from the Fergan crest (Sajmaly-Taš) to southern Siberia and Mongolia (see Littauer 1977, Šer 1980:194ff.). The significance of this Central Asian continuum is emphasized by researchers into the history of wheeled vehicles; it reflects an eastward advance in the direction of Mongolia and China in the second millennium B.C. (Piggott 1979:12).

6.6.17. *The ancient Indo-Europeans as possessors of wheeled wagons*

The early Indo-European tribes, who had possessed chariots and wheeled wagons since the Proto-Indo-European period and already had special terms for the wheeled vehicle and its parts, must have lived in the earliest center of diffusion of chariots in the fourth to early third millennia B.C., prior to the diffusion of these vehicles beyond Southwest Asia in the second half of the third millennium B.C.⁴² Placing the Indo-European tribes anywhere else in the period before the breakup, i.e. outside the center of diffusion of chariots and hence outside of

42. It is extremely interesting that various ethnic groups who lived in the original center of diffusion of wheeled vehicles have phonetically resemblant words for 'wheel' and 'chariot' (a situation reminiscent of that involving words for 'horse', see II.3.1.1.18 above): PIE **k^hoek^holo-*, Sum. *gigir*, Semit. **galgal-*, Kartv. **ggar-*, **br̥bar-*; cf. also the initial **gr-* of the reconstructed protoform for the ancient Chinese loan (from Indo-European) meaning 'sacred horses harnessed to the carriage of the sun' (Pulleyblank 1966:34).



Illustration 17.

Rock paintings of carts and chariots. Saymaly-Taš (after Šer 1980:195)

Southwest Asia, would lead to major chronological contradictions between the accepted date of the breakup and the spread of chariots and wagons out of Southwest Asia. The breakup could have been no later than the beginning of the third millennium B.C., as is supported by the status of the Anatolian languages — Hittite, Luwian, and Palaic — as independent languages by the beginning of the second millennium B.C. when they are recorded in inscriptions; the spread of wheeled vehicles out of Southwest Asia to adjacent regions occurs in the second half of the third millennium B.C.

If the early Indo-Europeans are to be located in this area at this time, then tribes speaking Indo-European dialects can be credited with the spread of wheeled vehicles beyond Southwest Asia to the north Pontic area, the Balkans and western Europe, and eastward to Central Asia and China. The Tocharians, far to the east in Chinese Turkestan, represent the expansion and branching of the Indo-Europeans that had taken place by the first millennium B.C.; their language preserves the ancient Proto-Indo-European words for 'wheel' and 'chariot'.

The conclusion that lightweight horse-drawn military carriages expanded from a center in Southwest Asia constitutes strong support for the claim that the horse was first domesticated and used for transport in some part of Southwest Asia; the subsequent wide expansion of the horse accompanies that of the military chariot. As recent investigations have emphasized, the rise of the lightweight chariot drawn by horses (rather than the oxen previously used) was an innovation that increased the speed of locomotion at least by a factor of ten (Piggott 1979:11).

Chapter Seven

The social organization, economy, and kinship system of the ancient Indo-Europeans

7.1. War as an occupation. Indo-European terms for weapons

7.1.1. Reconstruction of weapon names and a verb meaning 'pursue, destroy enemy'

One of the major occupations of the ancient Indo-Europeans was war, as is reflected by the presence of a number of Proto-Indo-European words referring to weapons and military attributes. In addition to words like 'battleaxe' (***p^helek^hu-**) and 'war chariot', discussed earlier, Indo-European or its early dialect groupings reveals a number of words referring to particular kinds of weapons such as swords and spears:

PIE ***^hnsi-/ *^hensi-** 'sword': Skt. *así-* 'sword; chopping knife', Avest. *aṇhū-* 'sword', Lat. *ēnsis* 'sword' (Pokorny 1959:771). Based on its Italic-Aryan dialect distribution the word can be considered Proto-Indo-European or at least datable to a very ancient dialect area at the time of the breakup. In both of the historical dialects attesting it — Sanskrit and Italic — the word denotes specifically an iron sword (see Thieme 1964:593-94). This meaning undoubtedly reflects a later semantic shift of the original meaning to refer to an iron weapon, since given the age of the word it must originally have referred to copper or bronze swords.

A more narrowly distributed dialect word, found in the same Greek-Aryan dialect grouping as ***p^helek^hu-** (Skt. *paraśú-*, Gk. *pélekus* 'war axe, poleaxe'), is Skt. *iṣu-* 'arrow', Avest. *iṣu-* 'arrow', Hom. Gk. *iós* (< **isw-os*) 'arrow'.

One of the earliest words for 'shield' may be represented by Luw. *palahša-* 'shield', Skt. *phálakam* 'shield; board', OIcel. *fjöl* 'board': PIE ***p^hol-** 'shield' (see Bomhard 1973:111). Note the preservation of aspiration in the voiceless labial in Sanskrit.

The diversity of weapon terminology in the daughter branches (see Schrader 1886:324-54) makes it almost impossible to find cognate terms for weapons of Proto-Indo-European or early post-breakup date. This is due to recurrent replacements of weapon terms as the weapons themselves changed with improved manufacturing technology in the individual tribal groupings (as was also the case with terms for tools).

In contrast to the instability of weapon terminology, words connected with warfare such as ‘kill’, ‘wound’, and ‘capture’ show more stability: PIE **ghoen-* ‘kill; destroy; pursue (enemy)’: Hitt. *kuenzi* ‘kills’, 3pl. *kunanzi* (frequently with the meaning ‘kill or destroy enemy troops’), Skt. *hánti* ‘kills’, 3pl. *ghnánti* (in Vedic often ‘kill or destroy a fleeing enemy’, ‘destroy a fortress’), *hatá-* ‘broken, killed’ (= Avest. *Jata-*), Avest. *Jainti* ‘beats, kills’, Arm. *ganem* ‘(I) strike, kill’, Hom. Gk. *theínō* ‘(I) beat, kill, strike’, *phónos* ‘murder, slaughter’, Alb. *gjanj* ‘(I) pursue, chase’, Lith. *genù* ‘(I) chase’, OPruss. *guntwei* ‘chase’, OCS *gŭnati* ‘chase’, Lat. *dē-fendō* ‘(I) defend’ (cf. Lith. *ginù* ‘(I) defend’), OIr. *gonim* ‘(I) wound, kill’, *guin* ‘a wound’, OE *gūþ* ‘battle, war’, OIcel. *guðr*, OHG *gund-* ‘battle, war’.

7.1.2. Indo-European words for taking plunder

PIE **se/orw-* ‘booty, plunder; take plunder’: Hitt. *šaru* ‘booty’, *šaruwai-* ‘take plunder; rob’, Welsh *herw* ‘raid; outlawry’, *myned ar herw* ‘go on a raid’, Mlr. *serb* ‘theft’ (Watkins 1975b).

PIE **lau-* ‘booty, plunder; take plunder’: Skt. *lótam*, *lóttram* ‘booty; plundered goods’ (attested by lexicographers), Att. Gk. *leíā* ‘booty’, Lat. *lucrum* (from **lu-tlo-m*) ‘winnings; advantage’, OIr. *lóg* ‘earnings, price’, OHG *lōn* ‘compensation, payment’ (Ger. *Lohn*), Goth. *laun* ‘payment’, cf. OCS *lovŭ* ‘capture, catching’.

7.1.3. Indo-European terms for ‘army, people’ and ‘military defense’

PIE **laH(w)o-* ‘people, folk; army; campaign’: Hitt. *lahḫa-* ‘campaign’, Hom. Gk. *lāwós* ‘people’, pl. ‘army’ (cf. compounds such as *lāwo-ssōos* ‘one who incites an army to fight’); in Greek the word referred to people in the sense of ‘collectivity of people capable of bearing arms’¹ (Benveniste 1969:II.89-95), cf. Myc. Gk. *ra-wa-ke-ta* = *lāwāgetās* ‘military leader’, cf. Dor. *lāgētās* ‘leader of people’, Phryg. *lawagtaei* ‘military leader’ (see Chantraine 1968-1974:III.619-20).

Another ancient Indo-European word is OPers. *kāra-* ‘army, people’ (cf. Pers. *kār-zār* ‘battlefield’), Lith. *kāras*, *kārė* ‘war’, *kārias* ‘army’, OPruss. *kargis* ‘army’, Hom. Gk. *koíranos* ‘commander, ruler’ (*koírane laōn* ‘O commander of the army!’; Iliad 7:234), cf. OIcel. *herjann* ‘father of the army’ (of Odin), *herr* ‘army’, Goth. *harjis* ‘army’, OHG *heri* ‘army’ (Ger. *Heer*), Mlr. *cuire* ‘troop, host’.

1. For the semantic typology cf. OPers. *kāra-* ‘army, people’, Hitt. *tuzzi-* ‘army’, both with cognates elsewhere in Indo-European meaning ‘people, tribe’, see below.

PIE ***wer-** 'defend (oneself), save (oneself), protect (oneself)': Hitt. *warrai-* 'come to aid', iter. *warrešša-* 'save, come to aid' (see Pokorny 1959:1161), Skt. *vr̥ṇóti* 'restrains, defends, covers', *várman-* 'defense, fortification', cf. *varū-tár-* 'defender', *vārūtha-* 'defense; shield; army', Avest. *varəθra-* 'opposition, defense', Hom. Gk. *erúomai* '(I) take care of, preserve, turn back', cf. *erusíptolis* 'defender of cities' (of Athena), MWelsh *gwerthyr* 'fortress' (formally corresponding to Skt. *vártra-* 'dam' = 'defense against water'), OIr. *Ériu* 'Ireland' (see Pokorny 1959:1161), Goth. *warjan* 'defend', OIcel. *verja* 'defend', OHG *weren* 'defend' (Ger. *wehren*).

7.2. The house or dwelling and settlement as ancient Indo-European units of social structure

7.2.1. The Indo-European term for 'house, dwelling'

PIE ***t'om-** 'house, building' designates the elementary social unit of the Indo-European tribes, one which presupposes a grouping of people living together and united by certain kinship bonds. The root is attested in the major ancient Indo-European dialects other than Hittite and Tocharian: Skt. *dāma-* 'house, living place' (in the Rigveda: acc. *dāmam*, loc. *dāme*), Avest. *dəm* 'house', *dəmi* (loc.) 'in the house', Arm. *tun* 'house', Hom. Gk. *dómos* 'house, dwelling, living place, shelter', Lat. *domus* 'house, dwelling, family', loc. *domī* 'at home, in the house', OCS *domŭ* 'house', cf. Lit. *nāmas* 'house, dwelling', Pokorny 1959:199.2

In Anatolian and Tocharian the original Indo-European word is replaced by innovations: Hitt. *pir* (Sumerogram *É-ir*), gen. *parnaš* 'house, household';³ Toch. A *wašt-* 'house', B *ost* 'house'.⁴ In Germanic we find the base ***hūs** 'house', which evidently replaced the earlier Indo-European word (see Lehmann 1968:11): OHG *hūs* 'house' (Ger. *Haus*), OE *hūs* (Engl. *house*).⁵

That the 'house' was the ancient Indo-European unit of social structure can

2. Although it has been claimed that Lith. *nāmas* 'house', Latv. *nams* are related to Gk. *némō* '(I) live, inhabit; herd livestock' (Vasmer 1964-1973:1.527).

3. A Common Anatolian word (cf. Hier. Luw. *parna-* 'house', Lyc. *pr̥nawa-* 'build', Lyd. *bira-* 'house') which has parallels in many Middle Eastern languages: cf. Egypt. *pr* 'house', Hurr. *pur(u)li* 'house', Haas 1975:56. A trace of an original Anatolian word reflecting PIE ***t'om-** may be Hier. Luw. *tama-* 'build' (see Szemerényi 1977b:96).

4. The word is cognate to Skt. *vāstu-* 'dwelling; house and yard; house', Hom. Gk. *ástu* 'dwelling, town'. It is an ancient derivative of ***Hwes-** 'live; be', which replaced the original Indo-European ***t'om-** 'house' in Tocharian.

5. Germanic ***hūs** 'house' has been claimed to be related to Yeniseian *qus* 'tent, house' (Dul'zon 1971:174). In that case, this Germanic borrowing, together with the analogous borrowing of a horse term from Altaic ***mor-** (see II.3.1.1.11 above), can be taken as evidence of the connections of some Ancient European languages with speakers of Central Asian languages.

be inferred from derivatives of ***t'om-** such as Skt. *dámpati-* 'master of the house' (for the semantics cf. Lat. *pater familiās* 'head of household'), dual 'heads of household, husband and wife', *pátir dán* 'master of the house', Avest. *dāng.pati-* 'head of household, head of family', *dāng patōiš* (gen.) 'of the master'; Gk. *despótēs* 'master (of house)'; Lat. *dominus* 'master (of house)', 'head of household'.⁶ Homeric Greek terms formed from the zero grade are *dmōs* 'servant', *dmōē* 'female servant, captive'. Taken together, these forms show that the Indo-European ***t'om-** was a dwelling uniting people by social and kinship features, and including a head of the house and servants.⁷

Houses contained hearths of two forms, round and square, which were opposed to each other as earth and sky symbols (Dumézil 1966:308-15, Vernant 1969:180). This fact suggests that the Indo-Europeans had two basic house types, round and square. Both of these house shapes are found in the wider Mediterranean culture area of upper Mesopotamia and the southern Caucasus; the round type is especially characteristic of the southern Caucasus (see A. Džavaxišvili 1973:300ff., 346).

7.2.2. *The Indo-European settlement as a grouping of houses*

A group of houses constituted the larger social grouping ***we/oikḥ-**, a settlement of several families united by certain social bonds; it took the form of houses grouped in communal settlements. This original organization of the ***we/oikḥ-** is still reflected in individual daughter Indo-European traditions. It is visible in the Avestan *vīs-* 'clan; grouping of several families' (cf. OPers. *viθ-*), *vīs-paitiš* 'head of clan' (cf. Skt. *viś-pāti-* 'head of household or tribe' beside Skt. *viś-* 'dwelling; tribe; clan; human race'); Lith. *viēšpats* 'master, lord', OPruss. *waispattin* (acc.) 'housewife' (cf. Skt. *viśpātnī* 'housewife'); Hom. Gk. *woikos* 'large house; dwelling; household',⁸ Lat. *uīcus* 'village, settlement; group of houses', Umbr. *uocu-com* 'building', Goth. *weihs* 'village', OCS *vīst* 'village', ORuss. *v's* 'village' (see Sreznevskij 1958:I.473), cf. *gradě ... vesi* 'in the city and in the village'.

6. Derivatives of ***t'om-** in ***-n-** such as Lat. *dominus* can be compared to ***-r-** formations like Myc. Gk. *da-ma-te* 'servants' (Lejeune 1958:187-201), Hom. *dámar*, gen. *dámartos* 'wife', reflecting an ancient heteroclitic *-r/-n-* alternation.

7. Contrary to Benveniste 1969:I.293-307, the stem ***t'e/om-** 'house' can be etymologically linked to the root ***t'em-** 'build, erect': Hier. Luw. *tama-* 'build', Khotanese Saka *padam-* 'make, do', Gk. *démō* '(I) build', *neō-dmatos* 'rebuilt', Goth. *gatiman*, OSax. *teman*, OHG *zeman* 'be recognized, arrive'; Olcel. *timbr* 'timber', OE, Engl. *timber*, OHG *zimbar* 'timber, dwelling' (Ger. *Zimmer*), cf. Goth. *timrjan* 'build', OHG *zimberen* 'build' (Ger. *zimmer*) (see Szemerényi 1977b:96). In this view, PIE ***t'e/om-** is a constructed dwelling inhabited by a group of people related by social and kinship ties.

8. In Greek, *oikos* also acquires the concrete meaning 'separate house, building', cf. the compound *oikodómos* 'housebuilder'.

7.2.3. The door as the exit from the house; the opposition of 'at home, in the house' to 'out of the house', 'in the village' to 'out of the village'

The way out of the house was through the door, ***dhur-**, which led out to the yard around the house. This positioning of house and yard can be established on the basis of the polysemy of ***dhur-** reflected in various historical dialects: Toch. B *twere* 'door', Skt. *dvār-* 'door', (pl.) 'double-hinged doors' (also a deity in the Rigveda), Avest. *dvarəm* 'gate, yard'; Arm. *duřn* 'door, gate, yard', pl. *durk* 'door', *i durs* 'outdoors', Hom. Gk. *thúrē* 'door, gate, entry, yard' (cf. *thúretra* 'folding sections, leaves; door, gate'), *thúraze* 'go away!', Alb. *dérē* 'door', Lat. *forēs* 'double door; entry', *foras, foris* 'outside, outdoors', OIr. *dorus* 'door', Goth. *daúr* 'door', OHG *turi* 'door' (Ger. *Tür*), OE *duru* 'door', OHG *tor* 'gate' (Ger. *Tor*), OE *dor* 'gate' (Engl. *door*); Lith. *dùrys* 'door', OPruss. *dauris* 'large double gate', OCS *dvŕrĭ* 'door', *dvorŭ* 'yard, courtyard'.⁹

Since there was an opposition of indoors to outdoors (Benveniste 1969:I.312-13) expressed by ***t'om-** and ***dhur-** respectively, there should also have been a comparable opposition of 'in the village', ***woik̥h-**, to 'outside the village'. The boundary of the village was probably referred to by ***e/orH-**: Hitt. *er̥ḫa-* 'border, boundary, country', *ar̥ḫa-* 'border, boundary, region; outside, away', *araḫza* 'around, outside, outside of the bounds', *araḫzena-* 'one living in the vicinity, outside the boundary', Latv. *āra* 'border, boundary, country, limit, region', Lith. *óras* 'air, weather', *iš óro* 'outside'.

7.2.4. The fence as the boundary of the house or village

For defense the village, or possibly the individual house and yard, could be surrounded with a fence, the term for which, ***gh(e)rdh-**, yields the expected reflexes in the historical dialects: Hitt. *gurta-* 'fortress' (cf. the Ugaritic borrowing *krđš* 'fortification', Friedrich 1952:119), Toch. B *kerciyi* (pl.) 'palace', Skt. *gṛhā-* (from **gṛdha-*) 'dwelling, house', Avest. *garəda-* 'burrow (as dwelling of daevic beings)' (cf. Common Permian **gort-* 'house, dwelling, living place', a borrowing from early Iranian: Votyak *gurt* 'village, settlement', Komi-Zyr. *gort* 'house', discussed in more detail below); Alb. *gardh* 'enclosed area', Lith. *gařdas* 'fence, enclosed area, sheepfold, stall', Goth. *gards* 'house', OIcel. *garđr* 'fence, yard', cf. OE *geard* 'fence, garden' (Engl. *yard*), OHG *garto* 'garden' (Ger. *Garten*); OCS *gradŭ* 'fortress, city, garden', Cz. *hrád* 'fortress, palace'.

***gherdh-** goes back to the root ***gher-/ *ġher-** 'fence in, surround', which

9. Many derivatives of ***dhur-** mean 'double door' (Sanskrit, Latin, Old Prussian), often with the dual or plural number. This may be grounds for positing that meaning for the Proto-Indo-European base.

also takes a **-th-* suffix to yield similar meanings: Hom. Gk. *khórtos* ‘fenced area, fence’, Lat. *cohors* (from **ko-ghr-ti-s*) ‘enclosed area, yard, cattleyard, cohort, part of a legion’, Welsh *garth* ‘enclosed area’; the Germanic forms OHG *garto*, OE *geard* mentioned above could equally well reflect the form with the **-th-* suffix.¹⁰

7.2.5. Fortified settlements and fortresses

Fortified settlements among the ancient Indo-Europeans were usually located on hills or cliffs, and words for them are usually etymologically connected to stems meaning ‘high’, ‘mountain’, ‘cliff’.

PIE **phel-* ‘fortress, fortified city’:¹¹ Skt. *pūr* ‘fortification, fortress’, Hom. Gk. *pólis* ‘city, fortified city’, cf. *akró-polis* ‘upper part of hill city’ (cf. Gk. *ptólis* ‘city’), Lith. *pilis* ‘castle, fortress’, Latv. *pils* ‘castle, fortress’. The word is dialectally restricted, found only in Indo-Iranian-Greek-Baltic, although the borrowed *patari* of Urartean (Melikišvili 1960:403) suggests that a form similar to Gk. *ptólis* existed in other early Indo-European dialects.

Of particular interest is another Indo-European word for ‘fortress, fortification’, **bh(e)rgh-*, which shows certain phonetic anomalies in its reflexes in a number of dialects. The word represents the same root as **bhergh-* ‘high; mountain’ (see II.5.2.4): Goth. *baúrgs* ‘city, tower’, OHG *burg* ‘fortress’ (Ger. *Burg*), Hom. Gk. *púrgos* ‘tower, bulwark, fortress, rampart’, Arm. *burgn* ‘tower’; the Greek form, like the Armenian one, is phonetically irregular. The phonetic similarity of the Greek and Armenian forms, and the fact that they coincide with forms having the same meaning in a number of non-Indo-European Near Eastern languages (Urt. *burgana-* ‘bulwark, fortress’, see Diakonoff 1971:82; Syriac *būrgā* ‘tower’) may indicate that these latter forms were borrowed from some early *centum* dialect of Indo-European with the regular reflex of the Indo-European voiced aspirates and *ur* as the reflex of syllabic **ṛ* (cf. Hübschmann 1972[1897]:393).

That this word for ‘fortress, fortification’ existed in dialects such as Sanskrit, Latin, and Tocharian can be inferred from the meanings of Skt. *bṛmhāti* ‘fortifies, strengthens, intensifies’, Lat. *fortis*, OLat. *fortus* ‘strong, hard, firm’, and Toch. A *prākār* ‘hard, solid’, B *prākre* ‘hard’. These meanings must

10. There are some further terms connected with the defense and fortification of houses and settlements: Skt. *pastiām* ‘house, dwelling’ beside the meanings of Arm. *hast* ‘strong’, OIcel. *fastr*, OE *fæst* (cf. Engl. *steadfast*), OHG *festi* ‘strong, solid’ (Ger. *fest*).

11. The word can be etymologically traced to the Indo-European stem **phel-* ‘cliff’: OIcel. *fjall* ‘cliff’, OHG *felis* ‘cliff’ (Ger. *Fels*), Mlr. *all* ‘steep slope’, Pashto *parṣa* ‘steep slope, bluff’, Skt. *pāṣāṇā-* ‘stone’, *pāṣyá-* ‘stone; stone fortification, bulwark’ (RV I, 56, 6). The meaning of Skt. *pāṣyá-* is especially revealing for this comparison, since it coincides with the meaning ‘fortress’ of **phel-*.

derive from an unattested word meaning 'fortification, fortress'. With this further dialectal evidence, the word can be regarded as Proto-Indo-European in the meaning 'fortified settlement; fortress on hill or cliff'.

A more narrowly distributed dialect word denoting a settlement on a hill is ***dheun-**, found in Celtic and Germanic: OIr. *dún* 'fortress', cf. Lat. *fūnus* 'burial, funeral' (evidently originally 'burial hill': Pokorny 1959:260, 263), OE *dūn* 'high place, mountain' (Engl. *down*), *tūn* 'city' (Engl. *town*) from Celtic ***dūn-**.

Another narrowly distributed dialect word for 'settlement' is ***sel-** 'living space': OHG *sal* 'dwelling, hall' (Ger. *Saal*), Lith. *salà* 'village', OCS *selo* 'village' (see Stang 1972).

These and similar dialect words having to do with dwellings and settlements could have arisen among the Indo-European tribes at relatively late stages of their dispersal into the western regions of Europe.

7.2.6. 'Fortification' and 'fortress' in individual early Indo-European traditions

The custom of building fortresses in high places is preserved in all the early Indo-European traditions. From the very beginning of Old Hittite history the Hittites are builders of fortress cities with stone walls and fortifications, located on hills. The Hittite construction of fortifications continues ancient Near Eastern traditions: see Bittel and Naumann 1952. The hymns of the Rigveda mention stone fortresses which are destroyed by Indra: *śatām aśmanmāyīnām purām indro vy āśyat* (RV IV, 30, 20) 'a hundred stone fortresses Indra destroyed'. In Mycenaean Greece of the fifteenth to fourteenth century B.C., massive fortified walls were built of rough-hewn stone (and later, in the thirteenth century B.C., of boulders): Blavatskaja 1976:97. The ancient Indo-European tradition of building fortified cities on hilltops is continued in prehistoric Europe (Clark 1952:164-65 [1953:169]).

7.3. Basic economic conceptions drawn from Indo-European linguistic data

7.3.1. Indo-European words meaning 'possessions', 'property', 'wealth'

In the reconstructed Indo-European settlement, which comprised several individual houses or groups of houses, economic activities were carried on which led to the accumulation of possessions and wealth. A social term connected with wealth and the obtaining of wealth through certain activities can be reconstructed for Indo-European: PIE ***Hoph-r/n-**, with the reconstructed

meanings ‘goods, wealth, possessions’ and with the related meaning ‘trade’ attested at least as early as Anatolian: Hitt. *ḫap-* ‘be in abundance’,¹² *ḫappar* ‘price, cost; trade’, *ḫapparai-* ‘sell, transfer, give back’ (Neu 1974:80-82),¹³ *ḫappinant-* ‘wealthy’, *ḫappineš-* ‘become wealthy’, *ḫappinahḫ-* ‘make wealthy’ (cf. *ḫappira-* ‘city’, etymologically ‘place where trade is carried on’), Skt. *ápnas-* ‘possessions, wealth, work’, Avest. *afnah-vant-* ‘rich in possessions’, Hom. Gk. *aphneiós* ‘well-off, wealthy (in money)’ (for *ph-* instead of the expected **p-* see I.1.5.7 above); Lat. *opes* (pl.) ‘possessions, abundance, wealth’, *Ops* ‘deity of abundance’,¹⁴ *opus* ‘work’, *officium* (from **opi-ficium*) ‘debt, duty, obligation, favor’, Olcel. *efna* ‘do’, OE *efnan* ‘do’, OHG *uoben* ‘fulfill’ (Ger. *üben*). Another ancient Indo-European word for ‘possessions, property’ was **reH(i)-*:¹⁵ Skt. *rayí-* ‘goods, possessions, wealth’,¹⁶ Avest. *raēvant-* ‘wealthy’, Lat *rēs*, gen. *rei* ‘thing, possession’.

7.3.2. Indo-European words for buying and selling

Wealth leads to the development of trade, which in turn increases wealth; and it leads to the development of exchange and buying and selling. A Proto-Indo-European term can be reconstructed which establishes this kind of activity among the ancient Indo-Europeans: PIE **we/os-(n-)* ‘buy, sell; price, trade value’: Hitt. *waš-* ‘buy’, *uš(a)niya-* ‘sell’,¹⁷ Skt. *vasnám* ‘price’, *vasnayántā* (ppl., du.) ‘those who trade’, *vásnya-* ‘pertaining to trade’, Arm. *gin* ‘price’, Gk. *ōnéomai* ‘(I) trade’, Myc. Gk. *o-no, o-na* (Chantraine 1976), Hom. *ōnos* ‘price, purchase’, *ōnētós* ‘bought’ (adj.), Lat. *uēnum* (acc.) ‘sale’, ORuss. *věno* ‘payment; bride price’, cf. Toch. B *was-, wäs-* ‘give’ (see Watkins 1975a).

Another ancient Indo-European term connected with trade is **k^hoer-/ *k^hor-ei-* ‘buy’: Toch. A *kuryar* ‘trade’, *kuryart* ‘trader’, Toch. B *karyor* ‘trade’, *käryā-* ‘buy’, Skt. *krñāti* ‘buys’, Gk. *priamai* ‘(I) buy’, OIr. *cren(a)im*

12. Cf. *takku-šmaš UL-ma ḫapzi* ‘if they have no income’, KBo XI 34 I 1.

13. The meaning ‘trade’ in Anatolian can be regarded as a derivative of the Proto-Indo-European meaning ‘wealth, income’. Trade was thus regarded as an economic activity which produced abundance or wealth. Synchronic semantic analysis of the Hittite meanings suggests an original meaning ‘trade’ in Hittite (Neu 1974:81); this may be true of Hittite, but it is not true of Proto-Indo-European.

14. Ops, the goddess of fertility and abundance, is one of the major ancient goddesses of Rome; special festivals were held in her honor at the end of August. Her sanctuary was located in the imperial palace Regia. Her name was the secret holy name of Rome (Dumézil 1966:162-63, 178-79, 260-67, 269); cf. also the meaning ‘city’ of Hitt. *ḫappira-*.

15. For the form see Burrow 1955 [1976:232], Szemerényi 1956.

16. Also used in the Rīgveda as the name of a deity *Rayí-* who personified wealth.

17. Frequent in the Hittite Laws (§§185, 186 and elsewhere): *ku-iš-(ki) wa-a-ši* ‘who buys’; cf. the combination of *ušnešk-* (iterative of *ušniya-* ‘sell’) and *ḫappar* ‘price’ in Hittite Laws, §35*.

'(I) buy', OLith. *krienas* 'bride price', Latv. *kriens* 'groom's gift to bride and her relatives', ORuss. *kr'nuti* 'buy, take': see Benveniste 1969:I.129-37.

7.3.3. Indo-European socio-economic terms: 'deprived', 'poor', 'thief'

The accumulation of wealth in cities and towns due to trade leads to social and economic stratification and to the rise of poor and rich. The existence of this social stratification among the ancient Indo-Europeans is reflected in terms reconstructible for Proto-Indo-European.

PIE **orbho-* 'deprived of one's share; deprived of possessions'. The original meaning can be reconstructed from the semantics of the reflexes, variously 'orphan' and 'servant, slave'. The original meaning 'deprived' yields 'orphan', i.e. 'child deprived of parents and inheritance', in Hom. Gk. *orphanós* 'orphan', Arm. *orb* 'orphan', Lat. *orbus* 'orphan' (which preserve the semantic element 'deprived'); Skt. *árbha-* 'small, weak; child', cf. Hitt. *arpa-* 'failure' (Pokorny 1959:782).¹⁸ The meaning 'servant, slave' (for this meaning, and for other words for non-free people, see II.1.2.9 above) is found in Arm. *arbaneak* 'servant', OCS *rabŭ* 'slave'; cf. Goth. *arbaiþs* 'work', OHG *arabeit* 'work' (Ger. *Arbeit*) and possibly also OHG *ar(a)m* 'poor' (if it comes from **arb-ma-*: see Pokorny 1959:782).

In addition to words having the particular meaning 'deprived' in Indo-European, we can posit special descriptive terms with the same sense based on words for 'god': the poor are depicted as deprived of possessions by the gods. This derivational model is attested in a number of early dialects and can be reconstructed for Proto-Indo-European: Hitt. *ašiwant-* 'beggar' from **ṇ-t'iu-onth-*, lit. 'not-god' (cf. OHitt. *šiu-* 'god'), ORuss. *u-bog* 'poor, beggar', *ne-bog* 'beggar', lit. 'not-god' (cf. Russ. *bog* 'god'), cf. Gk. *átheos* 'forsaken by the gods' (Laroche 1969:174).

Also connected with the unequal distribution of wealth is theft, reconstructible for Indo-European society on the evidence of PIE **(s)thah1-* 'rob, steal; conceal; thief': Hitt. *taya-* 'rob, steal', 3sg. *ta-ya-az-zi*, *ta-a-i-iz-zi* 'steals, robs', *tayazzil* 'theft', Skt. *(s)tāyú-* 'thief', *stéyam* 'robbery', *stená-* 'thief', Avest. *tāyu-* 'thief', *tāya-* 'theft', Gk. *tētáomai* '(I) am deprived, in need', OIr. *táid* 'thief', OCS *taŭ* 'thief', *tajiti* 'conceal, steal' (Russ. *taŭ*); probably also cognate is Gk. *sínetai* 'robs' (from **thi-n-ye-*), see Hollifield 1978:174.

The fact that we can reconstruct traces of an early Indo-European society which included people with wealth who engaged in trade as well as poor people and thieves points to a well-developed social stratification based on differential distribution of property.

18. A later semantic change is posited for Celtic and Germanic: OIr. *orbe* 'inheritance', Goth. *arbi* 'inheritance', OHG *arbi* 'inheritance' (Ger. *Erbe*): Porzig 1954:121-22 [1964:181-82].

7.4. Terms for social groupings and their leaders

7.4.1. *The Indo-European word for 'kin, clan'*

One of the basic structural units of ancient Indo-European society was the kin grouping ***k'en-(th-)** 'clan, tribe, kin collectivity'. The stem is etymologically related to ***k'en-** 'give birth' (Skt. *jánati* 'gives birth', OLat. *genō* '(I) give birth', Gk. *gígnomai* '(I) issue from, come from', etc.). The word for 'clan', etc. is a derivative in ***-th-** from this root, a formation well preserved in a number of early Indo-European dialects.

In Indo-Iranian the cognate fits into a strict hierarchy of social units in order of increasing size: ***t'e/om-** 'house', ***woikh-** 'village', ***k'en-th-** 'tribe'. The respective reflexes are: Avest. *dqman-* 'dwelling', Skt. *dám-* 'house'; Avest. *vīs-* 'village, settlement', Skt. *vís-* id.; Avest. *zantu-* 'tribe', Skt. *jantú-* ('tribe, clan' in the Rigveda): see Benveniste 1969:I.294-316.

In Italic the Proto-Indo-European word for 'clan', etc. is represented by Lat. *gēns*, gen. *gentis* 'clan; kinship grouping; tribe'. In Germanic the root is attested in a derivative, Goth. *kindins* 'clan leader' (from ***k'enthi-nos**): see Benveniste 1969:I.302, 315.

Another form of the root, thematic and without the suffixed ***-th-**, is attested in the meaning 'clan, tribe': Skt. *jána-* 'clan', Gk. *génos* 'clan', Lat. *genus*, gen. *generis* 'clan, tribe'. There is also a derivative in ***-i-** from the same root in Germanic: Goth. *kuni* 'clan', OHG *chunni*, OE *cynn* (Engl. *kin*).

Other suffixal derivatives of the same root are found in the historical dialects with the meaning 'tribal confederation' and related senses ('descendant', 'descent, provenience'): Lat. *nātiō* 'clan, tribe, nationality' (from ***gnātiō**), Skt. *jātí-* 'birth, family', OE (*ge*)*cynd* 'clan, nature, provenience' (Engl. *kind*).

Another Indo-European word for 'clan; descendant' may have been ***Hṛdh-**, reconstructible on the basis of Hitt. *ḫardu-* 'descendant', Luw. *ḫarduwat-* 'descendants' (Laroche 1959a:43), Hier. Luw. *há+rali+tu-sa* (Hawkins et al. 1973:148) and Slavic ***rodŭ**: OCS *rodŭ*, Russ. *rod* 'kin, clan'.

7.4.2. *Indo-European words for 'tribe, people'*

A term for a large social grouping uniting individual tribes and clans is the areal (Ancient European and Hittite) word ***theu-th-**: Hitt. *tuzzi-* 'army' (i.e. 'collectivity of people capable of bearing arms') alongside the Ancient European term for 'people, society': Goth. *þiuda* 'people', OIcel. *þjóð* 'people', OHG *diot* 'people', *diutisc* 'people's, folk' (the source of Ger. *deutsch* 'German'); Osc. *touto* 'community', Umbr. *totam* (acc.) 'society', OIr. *túath* 'people, tribe, country', Lith. *tautà* 'people, nation', Latv. *tauta* id., OPruss. *tauto* 'country'.

This word yields a dialectal derivative in **-ono-* meaning 'leader of a people': Goth. *þiudans* 'emperor', OIcel. *þjóðann*, cf. the Gaulish personal name *Toutonos* (see Szemerényi 1977b:100ff.).

7.4.3. The ancient Indo-European word for 'clan' and 'clan leader'

In addition to **k'en-* 'give birth', another word **Hons-/*Hns-* 'give birth, produce; kin; kinship grouping' must be posited for Indo-European. Its original meaning 'give birth' is preserved only in the Anatolian languages: Hitt. *ḫaš-* 'give birth', *ḫaššatar* 'clan, kin' (cf. *ḫaššannaš-šaš* 'his clansman; his blood relative', 2 BoTU 23 C 13), *ḫašša ḫanzašša* 'grandsons and great-grandsons', Luw. *ḫamša-* 'grandson', Hier. Luw. *hamasa-* 'grandson' (see Oettinger 1976:24), *hasu-* 'descendants'.¹⁹

The leader of such a kin group could naturally have been referred to by a derivative of the same root.²⁰ In Anatolian the word for 'king' (Hitt. *ḫaššu-* 'king', *ḫaššu-ššara-* 'queen', Hier. Luw. *hasusara-* 'queen', cf. the woman's name *Ḫašušar* in the Cappadocian tablets) is cognate to Hitt. *ḫaš-* 'give birth', *ḫaššatar* 'kin, clan'. This word has many cognates in other Indo-European languages and can be considered Proto-Indo-European: Avest. *ahū-* 'lord', *ahura-* 'master, lord, prince', *Ahura- Mazdā-*, lit. 'Wise Lord', OPers. *Auramazdā-*, name of a god, Skt. *ásura-* 'god, spirit, higher being', OIcel. *áss* 'god', Runic *a[n]suR*, Goth. *ansēs* 'demigods' (in Latin transmission), OE *ōs* 'god' (Polomé 1953, 1970:65).²¹

Despite the fact that Hitt. *ḫaššu-* already meant 'king, emperor' by the Old Hittite period, its historical connection to the word for 'clan, kin' is still preserved in Hittite tradition. The Old Hittite king (*ḫaššuš*) Hattusilis I (seventeenth century B.C.) considered all his subjects to be members of a single clan, descended from one mother: *šī-i-e-el ṚMEŠ.ŠU I.NA 1 AMA ḫa-aš-ša-an-te-eš* (HAB II 47) 'his (i.e. the king's) subjects are born from one mother'.

The fact that Indo-European had two roots, **k'en-* and **Hons-/*Hns-*, both meaning 'give birth, produce' and both having derivatives meaning 'clan, tribe, relative' and 'tribal leader, ruler, king', raises the question of how these

19. In the same tablets *-ḫšu* is found as the second element of Anatolian personal names; the meaning 'son, descendant' has been proposed for it: Goetze 1954:355, Laroche 1966a:297, 301, Gusmani 1968:94-95.

20. The typological plausibility of a semantic connection between 'give birth; kin' and 'ruler, leader, king' is supported by Proto-Germanic **kuningaz* 'leader, king' (OHG *chuning*, Ger. *König*; OE *cyning*, Engl. *king*), related to **kunja* 'clan, kin' (Goth. *kuni*, OHG *chunni*, OE *cynn*, Engl. *kin*), cognate to Gk. *génos* 'clan, kin', Skt. *jána-*, Lat. *genus*, etc. (see Gusmani 1968:100-101 et pass., Szemerényi 1977b:49).

21. For Sanskrit and Germanic a semantic shift from 'lord, ruler' to 'god' is posited. A trace of such a shift can also be seen in Avestan, where 'sovereign, lord' is an epithet of the deity.

roots were distributed among the historical dialects. A number of dialects lose derivatives of **k̑'en-* (Hittite, Tocharian, Balto-Slavic);²² others lose **Hons-/Hns-* but keep **k̑'en-* in the original meaning 'give birth; kin' (e.g. Indo-Iranian, Greek, Latin).

7.4.4. The Indo-European word for 'sacred king'

Another word for 'king, leader' of Proto-Indo-European date is **rek̑'-*, etymologically connected to the root **rek̑'-* 'direct, correct, straighten, even out';²³ Skt. *rājan-* 'king, ruler', *rājñī* 'queen', *rājyá-* 'imperial'; Lat. *rēx* 'king', *rēgīna* 'queen', *rēgius* 'royal'; OIr. *rí*, gen. *ríg* 'king', *rígain* 'queen', Mlr. *ríge* 'kingdom'; Goth. *reiki* 'kingdom, state', OHG *rīhhi* 'kingdom, state' (Ger. *Reich*), Pokorny 1959:854-57.

A whole complex of Roman rituals connected with the sacred king (*rēx sacrōrum*) and the imperial sanctuary Regia (the ritual of the *Equus October*, 'October horse', is discussed in II.3.1.1.7 above) coincides completely with the Sanskrit ritual of the Ashvamedha which was performed at the coronation of the king (see II.1.3.2 above). The same can be said of the complex of rites performed by the Druids in connection with the ancient Celtic king, *rí* (Dumézil 1966:31). This coincidence of rituals involving the same name in different historical traditions allows us to reconstruct the image of the ancient Indo-European sacred king **rek̑'-* who symbolized the unity and well-being of the entire society (cf. also Dubuisson 1978).

7.4.5. Dialect words for 'king', 'sovereign'

In Greek tradition, going back to the Mycenaean period, the king had analogous

22. In Anatolian the root *ḫaš-* 'give birth' (cf. also Hitt. *ḫaššatar* 'kin, clan') replaces **k̑'en-* in this meaning. However, **k̑'en-* may be reflected in Hitt. *g/ka-e-na-aš* 'in-laws; sons-in-law, brothers-in-law' (in the Telepinus text, Hitt. LÚMEŠ *kaenaš-siš* corresponds to LÚMEŠ *ḪATNI.ŠU* 'people of his affinal group' in the Akkadian variant, with Akkad. *ḫatanu* 'son-in-law, brother-in-law'). Hitt. *g/kaen-* could formally reflect PIE **k̑'en-* 'kin, birth' if we overlook the orthographic problem of *g/ka-* instead of *g/ki-*; the meaning 'affinal relatives' instead of 'blood relatives' may be due to the existence in Hittite of another word for 'birth, give birth', *ḫaš-*. For the plausibility of the semantic development cf. OCS *zjetl'* (Russ. *zjat'*) 'son-in-law; brother-in-law', Lith. *žėnas* id. from PIE **k̑'en-th-* and the replacement of this root in the sense 'give birth' by the innovation **rod-* in Slavic (Russ. *rod* 'kin, clan', *roždat'* 'give birth').

23. This set of meanings for the root is reconstructed on the evidence of words such as *ṛijánu* 'rush straight ahead', *ṛjú-* 'straight, right', *rājati* 'corrects, rules', Avest. *razan-* 'order', *rāštəm* 'straight', Gk. *orektós* 'aspiring', Lat. *rēctus* 'straight'.

On formal and semantic grounds (the formal grounds being the long vowel), Sihler 1977 proposes an etymological connection for this word not with **rek̑'-* 'direct, straighten' but with a root **reHk̑'-* 'strong, efficient' which he posits for Skt. *úrj-* 'food, strength, abundance', Gk. *arégō* '(I) come to aid', etc.

functions (Myc. *wa-na-ka*; Gk. *wánaks* 'king' is interpreted as 'sovereign, lord, king as head of state; god': Lur'e 1957:211-16, Ventris and Chadwick 1973:486). This word has a correspondent in Toch. A *nātāk* 'lord' (with **wn-* > *n-*: Winter 1970:53); cf. also Toch. A *ñkāṭ* 'god', Toch. B *ñakte* 'god' (Normier 1980).

The basic word for 'king' in Tocharian is Toch. A *wāl*, B *walo*. The word has a correspondent in a *-*dh*-stem with the same meaning in Celtic and in Germanic-Balto-Slavic: OIr. *fol-n-* 'dominate, rule', *flaith* 'domination, rule'; Goth. *waldan* 'rule', OHG *waltan* 'rule' (Ger. *walten*), OPruss. *wāldnikans* (acc. pl.) 'kings', Lith. *valdyti* 'rule, govern', OCS *vladq* '(I) govern, rule'.

Such terms, found in separate early dialect groupings and occasionally coexisting with older words having the same meaning, arose to refer to ruling and power at the period when Proto-Indo-European was beginning to break up and the individual dialect groupings were formed.

7.5. The Indo-European terminology of exchange

7.5.1. The general word for exchange: **t'oH-*

For the ancient Indo-Europeans, as for any archaic society, we find traces of relations between people based on the principle of exchange. This is exchange in the broadest sense, including exchange of things of material value (gifts as an early form of exchange preceding the development of trade relations; mutual hospitality; etc.), exchange of reciprocal services (including ritual ones), and exchange of things of spiritual value (including linguistic utterances and symbols). The exchange of women who are given in marriage occupies a special place in this exchange process. It determines the character of the society's marriage and kinship relations (see Lévi-Strauss 1967, Baal 1970).

Relations between people and gods in early societies can also be analyzed in terms of exchange theory as an exchange of gifts between the god and the person who makes a gift — a sacrifice — in exchange for good relations and favor bestowed on the person by the god (for sacrifice in Indo-European tradition see II.6.4.6 above).

The general word reflecting reciprocity and exchange relations is PIE **t'oH-*, which meant both 'give' and 'take'. In some historical dialects it has the meaning 'give' and in others 'take', thereby changing the original meaning of exchange into one pertaining to only one side of the relation, with no sense of reciprocity. In such dialect words we can see only individual traces of the ancient reciprocity relation presupposed by the process of exchange.

The meaning 'take' is best preserved in the Anatolian languages: Hitt. *da-a-aḫ-ḫi* '(I) take', Hier. Luw. *tà-a* 'he takes', Luw. *la(i)-* 'take', cf. Lyd. *dāv*

'(I) give', *dēt* 'possession'; the Hittite middle form *dattari* 'is taken' (i.e. 'given') serves to illustrate the mutual relation of the meanings 'take' and 'give' (cf. Lat. *datur* in the same meaning 'is given', from *dāre* 'give'). Hittite *daḥ-* 'take' also means 'take as wife' (it corresponds to both Akkad. *aḥāzu* 'take as wife' and Akkad. *leḫû* 'take').

The meaning 'give' is expressed in Anatolian by another root with the preverb *pe-*, thus leading to the semantic transformation of PIE **t'oH-* in Anatolian and the expression of the two aspects of exchange, giving and taking, by separate verbs. Hitt. *pai-* 'give' (1sg. *pí-iḫ-ḫi* 'I give', past *pí-iḫ-ḫu-un* 'I gave'), Luw. *piya-* 'give', Hier. Luw. *pia-*, Pal. *piša-* 'give' (iterative, cf. Hitt. *pešk-*). The root is found with the meaning 'give' in Tocharian: Toch. B *ai-*, A *e-* 'give'. The Anatolian-Tocharian **(p)-ai-* 'give' has further etymological connections (Pokorny 1959:10-11): Gk. *áinumai* '(I) take, grab', *aîsa* 'lot, fate', Avest. *aēta-* 'allotted portion', Osc. *aeteis* (gen.) 'part'.

The meaning 'give' of PIE **t'oH-* 'give, take' is preserved in a large group of early dialects (excluding Anatolian and Tocharian): Skt. *dádāmi* 'I give', Avest. *dadāiti* 'he gives', OPers. *dadātuv* 'let him give', Arm. *tam* '(I) give', Gk. *dídōmi* '(I) give', Lat. *dō* '(I) give', Lith. *dúomi* '(I) give', OPruss. *dāst* 'gives', OCS *damī* '(I) give'. The meaning 'take' is expressed in this dialect group by other words, unrelated to **t'oH-*: Skt. *āpnóti* 'receives' (cf. *dāná-* *apna-* 'receiver of gifts'), *aśnóti* 'receives', Gk. *hairéō* '(I) take', Lat. *prehendō* '(I) grasp, take', etc.

In Sanskrit and Old Iranian, **t'oH-* preserves traces of the meaning 'take' as well, in middle forms with the preverb *ā-*: *ā-dā-* 'take, receive', *ādadāthe* (du. mid. perf.) 'you took, you received' (RV I, 139, 2; Grassmann 1873:590; see Benveniste 1966a:316-17).

Traces of the original combination of senses 'give, take' in a single root with a meaning of reciprocity, or at least evidence of a lack of distinction between the two meanings, can also be seen in **-r/-n-* derivatives of **t'oH-* which mean 'gift', i.e. both 'that which is given' and 'that which is received': Hom. Gk. *dōron* 'esteemed gift, wedding gift', Arm. *tur* 'gift', OCS *darŭ* 'gift'; Skt. *dāna-* 'gift', Lat. *dōnum* 'gift', OIr. *dán* 'gift', Lith. *duonis* 'tribute', OCS *danŭ* 'gift'; cf. also other ancient derivatives of the same root: Gk. *dósis* 'gift', Skt. *díti-ḥ* 'gift', Lat. *datiō* 'gift', Lith. *dovanà* 'gift', etc.

7.5.2. Other Indo-European words for exchange

Another Indo-European word pertaining to exchange, although a dialectally more restricted one, is **nem-* 'give, allot; take': Avest. *nəmah-* 'loan; obligation', Hom. Gk. *némō* '(I) distribute'; Goth. *niman* 'take', OHG *nēman* 'take' (Ger. *nehmen*), Latv. *ņemt* 'take'; OIr. *nem* 'gift'. Possibly related to this root

is ***em-**, with the same range of meanings: Lat. *emō* '(I) take, buy', OIr. *em*- 'take', Lith. *imù* '(I) take', OCS *imq* '(I) take'.

***mei-(n)-** 'change, exchange' may be regarded as an ancient Indo-European word referring to exchange in the broad sense: Skt. *máyate* 'exchanges', Latv. *mīt* 'change, exchange' (especially of marriage exchanges), Lat. *commūnis* 'common', *mūnus* 'obligation, service, duty; gift' (see Palmer 1956, Benveniste 1969:I.187), OIr. *móin* 'value, treasure', *dag-móini* 'good gifts', Goth. *gamains* 'common' (originally 'mutual'), OHG *gimeini* 'common' (Ger. *gemein*), Lith. *maĩnas* 'exchange', Latv. *maĩna* 'exchange', OCS *měna* 'exchange'.

Derivatives in ***-th-** of the same root ***mei-** yield meanings pertaining to reciprocity and pairedness: Skt. *mitháti* '(he) exchanges', *mithá-* 'mutual', Avest. *miθwara-* 'paired', Lat. *mūtō* '(I) change, exchange', *mūtūus* 'mutual', Goth. *maipms* 'gift', Skt. *Mitrá-* 'god of treaty', i.e. of mutual agreement; cf. OCS *mirŭ* 'mutuality; treaty' in the same meanings (Toporov 1968).

7.5.3. Hospitality

The institution of exchange in ancient societies makes it possible to understand customs connected with hospitality. Hospitality is a particular kind of exchange relation, one holding between a host and a guest who can subsequently trade roles, the guest becoming host and vice versa. This is why the meanings 'host' and 'guest' — i.e. 'giver of hospitality' and 'receiver of hospitality' — can be combined in a single word. This is precisely the semantics that must be ascribed to PIE ***ghosthi-** 'host, guest' on the evidence of the historical reflexes: Lat. *hostis* 'alien', *hospes*, gen. *hospitis* 'foreigner; guest; giver of hospitality, host' (from **hosti-* + **pot-s* 'guest' + 'master, host'); Goth. *gasts* 'guest', Oícel. *gestr* 'guest', OE *gięst* (Engl. *guest*), OHG *gast* 'guest' (Ger. *Gast*), OCS *gostŭ* 'guest'. This dialectal lexical correspondence permits us to reconstruct an areal Indo-European word ***ghosthi-** 'guest, host'. If Luw. *kaši-* 'visit' is cognate (Ivanov 1965:39), the root is Proto-Indo-European.²⁴

More clearly Proto-Indo-European is PIE ***ar(y)o-**, with analogous meanings 'lord, master, host' and 'guest, foreigner': Hitt. *ara-* 'friend, comrade', *araš aran* 'each other', Skt. *arí-* 'friend; foreigner' (Thieme 1938), *aryá-* 'master of house'. By Indo-Iranian times the word had become a collective self-designation for the Indo-Iranians: Skt. *árya-* 'Aryan, Indo-Aryan', OPers. *ariya-čiça-* 'of the Iranian race' in the Darius inscription; *ariyānām* (gen. pl.)

24. Luw. *kaši-* is attested in a Luwian formula pronounced by the Hittite priestess Tunnawi: *a-ri-ya-ad-da-li-iš DIM-an-za šar-ri ka-ši-i hu-e-hu-i-ya tap-pa-aš-ša-it šar-ri ti-ya-mi hu-i-hu-i-ya* (Tunnawi I, 59) 'friendly(?) Thunder God, hurry from above to visit (as a guest), hurry from the sky above to the earth!' *Ka-ši-i* (an *i*-stem) is in the dative and means 'to visit, for visiting'; it may reflect PIE ***ghosthi-** in form and meaning. PIE ***-sth-** is reflected in Luwian as *-š(š)-*, cf. Luw. *hašša-* 'bones', Hitt. *haštai*.

'land of the Aryans', the source of *ērān*, Pers. *īrān* 'Iran'; pre-Oss. **Alani* 'the Alans' from **Aryana* (Benveniste 1969:I.369-72); cf. OIr. *aire* 'noble, free', *airech* 'noble'; also *Ériu* 'Ireland' (but see 7.1.3 for a different etymology).²⁵ The original meaning of the word, 'host', 'guest', 'friend', develops in the individual historical traditions into 'member of one's own tribe',²⁶ and then into a self-designation of the tribe (*árya*-) and its territory (*īrān*, *Ériu*).

7.6. The ancient Indo-Europeans' system of marriage relations and kinship by marriage

7.6.1. Marriage as exchange of women. The earliest Indo-European terminology for marriage relations

Marriage relations, which determine kinship ties and hence social organization in early stages of social development, are regulated in ancient societies by special rules of exchange and are often referred to by the same words as are used for other types of mutual exchange.

The Indo-European root ***t'oH-** 'give, take' could also mean 'take a wife', as is reflected in a number of ancient Indo-European dialects. This must be the reason for the virtually complete absence of any Indo-European terminology for marriage apart from words connected with exchange in general. Typically, special terms for marriage in the individual Indo-European traditions are formed from the basic words having to do with exchange (e.g. OCS *brakŭ* 'marriage' from **brati* 'take').

One ancient Indo-European word pertaining to marriage may have been ***Hwedh-** 'lead away, carry off a bride (by force)': Hitt. *huittiya-* 'pull, drag', Avest. *vādayeiti* (causative) 'makes go; pulls', cf. Skt. *vadhū-* 'bride, young woman', Avest. *vaδū-* 'married woman', OIr. *fedid* 'leads', Lith. *vedù* '(I) lead, get married (of a man)', OCS *vedq* id., *nevěsta* 'bride', ORuss. *voditi* (*ženu*) 'get married', lit. 'lead a wife'.

25. See, however, Szemerényi (1977b:125ff.), who denies the cognate status of the Celtic and Indo-Iranian words and therefore questions the Proto-Indo-European nature of the word. In this view Hitt. *ara-* and the Indo-Iranian words are borrowings from Afroasiatic languages: cf. Ugar. *'ary* 'relative, comrade', Egypt. *irj* 'comrade'. Even if we admit a Near Eastern origin for the Indo-European words, it is difficult to deny the Proto-Indo-European nature of ***ar(y)o-**, which can be reconstructed on the evidence of historical Indo-European dialects (including Celtic). Near Eastern connections for clearly Proto-Indo-European words are found in a number of other instances, as has been argued above: ***thauro-** 'bull', ***k'oou-** 'bull, cow', ***reudh-** 'ore', ***bhei-** 'bee', etc.

26. The semantically close dialect word ***dhreugh-** has derivatives of similar meanings: Lith. *draūgas* 'friend, comrade', OCS *drugŭ* 'friend, comrade', Olcel. *drótt* 'military detachment; prince's retinue' beside Avest. *draoga-*, OPers. *drauga-* 'lie, false', *adurujiya* '(he) lied', Skt. *drúh-* 'hostile demonic being'.

7.6.2. Abduction as the earliest form of marriage

The existence of a word pertaining to marriage but not belonging to the terminology of exchange points to one form of marriage that did not fall within the system of mutual exchange: marriage by abduction or forceful kidnap of the bride. Traces of this kind of marriage among the ancient Indo-Europeans can be observed in the meanings of this word in the individual historical dialects and in the custom of kidnapping brides preserved in historical Indo-European traditions.

In the Hittite tradition, abduction of a bride that resulted in loss of life was labeled with a special expression 'the kidnapper becomes a wolf'. In the Hittite Laws we read: *ták-ku SAL-an ku-iš-ki pít-te-nu-uz-zi... ták-ku 2 LÚMEŠ na-aš-ma 3 LÚMEŠ ak-kán-zi šar-ni-ik-zi-il NU.GÁL zi-ik-wa UR.BAR.RA ki-ša-at* (Hittite Laws, §37) 'if someone kidnaps a woman ... (and) two or three people are killed (in the ensuing struggle), there is no compensation (to be made): you have become a wolf.'

An exact correspondent to this Hittite practice is found in the custom of abduction described in the Sanskrit laws: *hatvā chittvā ca bhittvā ca krośantīm rudañtīm gṛhāt prasahya kanyāharaṇaṁ rākṣaso vidhir ucyate* 'the forceful abduction of a weeping girl from her house, with the murder or wounding (of her relatives) and breaking into the house, is called *rakshas* rite' (Laws of Manu, III 24).

Irish tradition preserves a special term for forceful abduction of a bride, *lánamus foxail*. In Roman mythic tradition, the rape of the Sabines is described with the expression *rapere uirgines* 'forcefully carry off girls' (Watkins 1970a:324, Peruzzi 1970:87ff.). The abduction of brides, reflected in Roman tradition as a legend and hence belonging to prehistoric antiquity, shares features with an analogous custom of marriage by abduction in ancient Greek tradition (*hē harpagē tôn gunaikōn*). This ancient custom, which by classical times was preserved only in legends, is illustrated by the myth of the capture of Medea by the Argonauts, and the Homeric myths of the kidnap of Persephone and the abduction of Helen (Peruzzi 1970:87ff.). As a rule, it was women of another tribe that were captured: the Sabines by the Romans,²⁷ the Colchidian Medea by the Greek Jason, the Greek Helen by the Trojan Paris. All this evidence points to a widespread custom of bride capture in prehistoric Greco-Italic tradition, remembered in classical times in the form of legends.

In the Avesta, a custom of bride capture is reflected in the formula *us-vādaya-* 'kidnap a woman; carry off by force'. This must preserve the original meaning of the verb **Hwedh-* 'carry off a woman by force; capture a bride'. This meaning is also evident in the (albeit transformed) meanings of the

27. In the legend of the rape of the Sabines as described by the Roman historian Livy, 'Sabines' should be understood as referring to women of various clans, among whom the Sabines were the wealthiest and most prosperous group: see Peruzzi 1970:88.

Hittite cognate *ḫuittiya-* ‘pull, drag’ (PIE ***Hwedh-**); the zero grade (PIE ***Hudh-**) is represented in Hittite by the prefixed *peḫute-* ‘lead away, carry away’ (cf. the verb with the opposed directional prefix, *uwate-* ‘bring, lead’: Pedersen 1938:§87, Benveniste 1962a:38-39, Szemerényi 1977b:199ff.).

7.6.3. *Various forms of marriage among the ancient Indo-Europeans*

Indo-European ***Hwedh-** ‘carry off by force; capture a bride’, which coexisted with another term for marriage related to the terminology of exchange (***t'oH-** ‘give, take’, including ‘give or take a wife’), eventually lost its original meaning ‘abduct’ in the individual historical dialects and became the general word for marriage, so that other derivatives pertaining to the terminology of marriage as exchange were derived from it. This is the source of derivatives in ***-mno-** referring to wedding as exchange, e.g. Hom. Gk. *hédna, éedna* (pl.) ‘wedding gifts; compensation (paid by the groom to the bride or her father); dowry’, *ewednōtēs* ‘father of the bride; one who gives out, distributes’, *ewednōō* ‘(I) give out, distribute; furnish with dowry’, OE *weotoma, wituma, wetma* ‘bride price’, OHG *widomo, widemo* ‘dowry’, cf. Hitt. *kušata-* ‘wedding compensation’ (for the etymology cf. Gk. *kústhos* ‘female genitalia’: Weitenberg 1975).

The same change of meaning from ‘marriage by force or abduction’ to ‘marriage by exchange’ is visible in Avestan, where both meanings are found in the same verb *vādaya-*, depending on the preverb: *upa-vādaya-* ‘give a woman in marriage’ and *us-vādaya-* ‘kidnap, abduct a woman’.

The fact that there is evidence of two forms of marriage among the ancient Indo-Europeans — marriage as part of the exchange system and marriage by abduction — may reflect certain aspects of the social structure of the Indo-European tribes at the time of their breakup and migration to new territories and consequent contact with foreign tribes. The basic form of intermarriage with foreign tribes in such circumstances could have been abduction, while the rites of marriage by exchange were observed within one’s own tribe or related tribes, since relations with members of one’s own tribe were regulated by a complex system of social conventions.

7.6.4. *Indo-European terms for ‘man’ and ‘woman’ as spouses*

Married people could be referred to by special terms with the respective meanings ‘woman, housewife, mistress of house’ and ‘man, master of house’:

PIE ***k'oen-** ‘woman; wife’: Toch. A *śām* ‘wife’, B *śana*, Skt. *jāni-* ‘wife, woman’ (cf. Skt. *gnā́* ‘goddess; wife of god’), Avest. *Jaini-* ‘wife, woman’, Pers. *zan* ‘woman, wife’, Arm. *kin* ‘woman’, Hom. Gk. *gunḗ*, gen. *gunaikós* ‘woman,

wife', Goth. *qinō*, OHG *quena* 'woman, wife', OE *cwene* 'woman, wife', OIr. *ben*, *bé* 'woman', Alb. *zónjë* 'woman, housewife', OPruss. *genno* (voc.) 'woman', OCS *žena* 'woman, wife'.²⁸

PIE ***photh-** 'master, sovereign, husband': Toch. A *pats* 'husband', Ved. Skt. *pāti-* 'lord, master, husband', Avest. *paiti-* 'lord, ruler, husband', Hom. Gk. *pósis* 'husband', Goth. *brūþ-faþs* 'groom' (cf. *hunda-faþs* 'leader or ruler of 100 men'), Lith. *pàts* 'husband' (also 'himself': cf. Avest. *xvāē-pati-* 'he himself'); cf. OCS *potī-pěga* 'divorced woman'.²⁹

The Proto-Indo-European nature of ***photh-** 'master, sovereign, husband' is shown in its dialect distribution, which comprises all the major ancient dialect groups: (Hittite?)-Tocharian-Germanic-Balto-Slavic, Indo-Iranian-Greek.³⁰ The absence of this word for 'husband' from Latin can be explained by the relatively recent dialectal semantic extension of *uir* 'man' (cf. Skt. *vīrá-* 'man, hero', Lith. *výras* 'man', etc.); cf. the analogous semantic development of ***manu-** from 'man' (Skt. *mānuṣ-* 'person, man') to 'husband' in Germanic and Slavic: Goth. *manna*, OHG *mann* 'man, husband', ORuss. *muž* 'person; husband'.

The original meaning of PIE ***photh-** must have been 'lord, ruler, master', as is shown by terms such as Skt. *viś-pātiḥ* 'leader, master of village' discussed above (from the verb root ***photh-** 'be able; reign': cf. Lat. *potis* 'powerful' beside *potior* '(I) am able, have possession', Skt. *pátyate* 'rules'). This points to the patriarchal nature of the Indo-European family and the dominant role of the husband, the 'father of the family' — Lat. *pater familiās* (see Watkins 1971:1500, P. Friedrich 1966:16, Benveniste 1969:I.246).

A derivative of this word is ***phothnī** 'wife, lady': Skt. *pātnī* 'lady, wife', Avest. *paθnī-* 'lady', Myc. Gk. *po-ti-ni-ja* 'lady, wife, mistress of house', Hom. Gk. *pótnia* 'lady, wife', Lith. *višpatni* 'lady'.

7.6.5. The Indo-European word for 'widow'

Marriage, and the status of husband or wife, were such a general feature of ancient Indo-European social relations that a man or woman who was not

28. The Old Hittite word for 'woman, wife' is not attested, being hidden by the Sumerian logogram SAL 'woman' plus phonetic complement *-n-*: acc. SAL-*nan*, dat.-loc. SAL-*nī* (Friedrich 1952:290). The *-n-* permits the assumption that the Hittite word is cognate to the Indo-European one discussed here. For the related Luwian word **wana-/wanatti-* 'woman', connected to the same Indo-European root, see also Starke 1980.

29. The Hittite word for 'man' is concealed by the Sumerogram LÚ plus phonetic complement *-iṣ-*: LÚ-*iṣ* (e.g. in the Hittite Laws, §197). A connection to the *-i-* stem of Skt. *pāti-*, Gk. *pósis*, etc. cannot be ruled out. Relevant to this question is the Hittite emphatic particle *-pat*, which coincides in form and function with the Lithuanian particle *pāt* that is cognate to *pàts* 'himself; husband'.

30. This conclusion is in disagreement with Benveniste's claim that Indo-European lacks a special word for 'husband' (1969:I.246). Some investigators have regarded the word reflected in Lat. *uir* as the Indo-European word for 'husband' (see Gates 1971:52-53).

married (due to the death of a spouse or to never having married) received a special designation based on the word meaning 'detached, separated' or 'devastated, wasted, empty':³¹ PIE **widheu-*: Skt. *vidhāvā* 'widow', Avest. *viḍavā-* 'widow', Hom. Gk. *ē(w)ítēos* 'bachelor, youth', Lat. *uidua* 'widow; divorced or unmarried woman', OIr. *fedb* 'widow', Goth. *widuwo* 'widow', OE *widuwe* (Engl. *widow*), OHG *wituwa* (Ger. *Witwe*), OPru. *widdewu*, OCS *vŭdova* 'widow'.³²

7.6.6. Indo-European terms for affinal kinship

Marriage can be claimed to have formed the basis of the entire Indo-European social structure, the foundation for the further development of affinal kinship relations (i.e. the acquired kinship of the two sets of consanguines, probably subsumed under the general term **k̑en-* discussed in 7.4.1 above). In the Indo-European kinship terminology a significant number of words express affinal kinship:

**t'aiwēr-* 'husband's brother': Skt. *devár-*, Arm. *taygr*, Hom. Gk. *dāēr*, Lat. *lēuir*, OHG *zeihhur*, OE *tācor*, Lith. *dieveris*, Latv. *diēveris*, RChSl. *děver'* (Pokorny 1959:179).

PIE (dial.) **k̑al(ou-)* 'husband's sister': Hom. Gk. *galóōs*, Lat. *glōs*, gen. *glōris*, ChSl. *z"l'va*; cf. also Phryg. *gélaros*, *gállaros* · *adelphoû guné* 'brother's wife' (with a shift of the original meaning): Szemerényi 1977b:88ff.

**(y)enH̑ther-* 'husband's brother's wife': Skt. *yātar-*, Pashto *yōr* (from **yāth-*), Hom. Gk. *einatēres*, Lat. *ianitrīcēs* 'husband's brothers' wives', Russ. *jatrov* 'husband's brother's wife', OCzech *jatruše* 'uxor fratris mariti', 'husband's brother's wife', Lith. *jentė*, Latv. *ietere* 'husband's brother's wife' (see Trubačev 1959:137-38); Szemerényi 1977b:92.

7.6.7. Terms for affinal relations between ego's generation (G⁰) and the generation of ego's parents (G⁻¹)

PIE **šoeḱhruH-* 'husband's mother': Skt. *śvaśrū-*, Pers. *xusrū*, Arm. *skesur*, Hom. Gk. *hekurá*, Lat. *socrus*, gen. *socrūs*, Goth. *swaihrō*, OHG *swigur*, OE *sweger*, OCS *svekry*.

**šoeḱhuro-* (by dissimilation from **šoeḱhru-ro-*) 'husband's father': Skt.

31. Cf. Skt. *vin dhāte* 'is empty, deficient', *vidhū-* 'alone', Lat. *uiduus* 'empty, deprived', etc.

32. If Hitt. *SALudati-* 'widow' is also cognate (see Friedrich 1952:237), then the Proto-Indo-European character of the word can be regarded as proven. *SALudati-* can be regarded as a transformation (with dissimilative loss of *-wa-*, also attested in other words) of the early Hittite **widawati-*, which would reflect PIE **widheu-*: see Szemerényi 1977b:85.

śvāsura-, Avest. *xvasura-*, Gk. *hekurós*, Lat. *socer*, Goth. *swaihra*, OHG *swehur*, Lith. *šėšuras*, Slav. **svekrŭ* (see Szemerényi 1964:291ff.).

**šoeķruH-* can probably be segmented into **šoe-*³³ 'one's own' (reflexive pronoun), 'member of one's own collective or family', and **ķhr-* 'head'. **šoeķhr-* could thus have meant 'head of family, head of one's own people' (see Szemerényi 1964:313ff., 1977a:392). This can be seen as an indication of the dominant position of the father in the extended family, with his sons and their wives subordinate to him.

The sons' wives were referred to by the special term **snuso-* 'daughter-in-law': Skt. *snuṣā*, Arm. *nu*, gen. *nuoy*, Hom. Gk. *nuós*, Lat. *nurus*, gen. *nurŭs*, OHG *snur*, OE *snoru*, Slav. *snŭxa*.³⁴ **snuso-* could also refer to a wife of ego's generation, that is, to a brother's wife, as is shown by the meaning of Hom. Gk. *nuós* 'wife of blood relative (son or brother)': see Gates 1971:24-25.

7.6.8. The general structure of affinal relations, and terms for affines

Analysis of the Proto-Indo-European affinal terminology reveals one essential feature of Indo-European kinship: only terms for the husband's relatives in relation to the wife can be reconstructed; words for the wife's relatives in relation to the husband are entirely lacking.³⁵ Thus we reconstruct the asymmetrical system shown in Table 1.

Table 1

Generation	Affinal relative	Of husband	Of wife
0	Brother	<i>*t'aiwēr-</i>	—
0	Sister	<i>*ķ'al(ou-)</i>	—
-1	Father	<i>*šoeķhuro-</i>	—
-1	Mother	<i>*šoeķruH-</i>	—

33. The archaic Indo-European form probably contained an initial labialized sibilant **š^o-*, a phoneme which was subsequently segmented out into the cluster **sw-*: see I.2.4.3.

34. For the original root cf. also **(s)neubh-*: Lat. *nŭbō* 'take as wife', *cōnŭbium* (from **co-snŭbiom*) 'marriage', Gk. *nŭmphē* 'bride; nymph' (Hom. *nŭmphios* 'newlywed'): see Pokorny 1959:978.

35. A special term for 'wife's brother' found in individual dialects, Skt. *syālā-*, ORuss. *šurin*, even if the correspondence is admitted as regular, is restricted to a narrow dialect zone (see P. Friedrich 1966:17) and cannot go back to Proto-Indo-European or even to any very early dialect grouping.

This obviously reflects a system of kinship relations whereby the wife acquires affinal ties upon entering the husband's family, whereas her relatives are not regarded as bearing any kind of kinship relation to her husband.

On the other hand, there is a revealing lack of Indo-European terms referring to husband of sister or to husband of daughter,³⁶ as shown in Table 2. This is because a sister or daughter who marries and acquires new kinship ties naturally leaves her parents' house and thereby breaks her kinship relations with her family. Her new relatives are not regarded as relatives by the members of her birth family.

Table 2

Spouse	Affinal relative			
	of son	of daughter	of brother	of sister
Husband		—		—
Wife	*snuso-		*snuso-	

7.6.9. *The patrilocal character of the Indo-European extended family*

The relations described here testify unambiguously to the patrilocal character of marriage among the ancient Indo-Europeans: the wife comes to live with her husband's family, breaking the ties with her birth family and becoming fully included in the system of kinship relations of her new family (see Risch 1944, Watkins 1971:1500, and, for Homeric Greek, Gates 1971:25). This system of marriage relations is in complete accord with the abduction of brides described earlier, a practice which broke off all of the wife's ties to her former family and established new acquired kinship relations within the husband's family.

The extended family can therefore be defined for Indo-European as a collective of people united by consanguineal kinship and assimilating wives from other families; the wives are related by marriage to their husbands, who in turn are members of the extended family.³⁷ The women of this family who are

36. Lat. *gener* 'sister's husband; groom', OCS *zētl* 'sister's husband, daughter's husband', Lith. *žentas* id. are due to relatively recent semantic shifting of PIE **k'en-* 'kin': Latv. *znuōts* 'brother-in-law, son-in-law', Gk. *gnōtós* 'relative', Skt. *jñāt-* 'relative' (see also note 22 to this chapter), Hitt. *kaena-* 'in-laws'. It is interesting that this one-sided system of in-law relations, with terms for the husband's relatives but virtually none for the wife's, is preserved in Greek up to the time of Homer: see Gates 1971:25.

37. A special term **nes-* 'return home, be reunited with relatives' can also be reconstructed for Indo-European: Toch. A *naṣu* 'friend', Skt. *násate* 'is united, collected, reunited', Hom. Gk. *néomai* '(I) return (home)', *Néstōr*, lit. 'one who always returns', *nóstos* 'return,

consanguines of other wives of the family marry, leave their own family, and enter another, where they acquire affinal relations. In any extended family the female consanguines of ego's generation (G^0) or a younger generation (G^{+1}), that is, sisters and daughters, function as objects of marriage exchange. They usually leave their own family and enter another, and women of the other family are taken in exchange.

The system of affinal kin terms is summarized in Table 3.

Table 3
Affinal kin terms

Affine	PIE term
Husband	*photh-
Wife	*k'oen-
Husband's father	*s _o eḱhuro-
Wife's father	—
Husband's mother	*s _o eḱhruH-
Wife's mother	—
Husband's brother	*t'aiwēr-
Wife's brother	—
Husband's sister	*k'al(ou-)
Wife's sister	—
Husband's brother's wife	*(y)enH ₂ ther-
Sister's husband	—
Daughter's husband	—
Son's wife	*snuso-
Brother's wife	*snuso-

7.7. The ancient Indo-Europeans' consanguineal kinship system

7.7.1. G^0 kinship terms

In addition to the affinal kin terms shown in Table 3, a system of terms for consanguineal kin can also be reconstructed for Proto-Indo-European:

arrival' (cf. the zero grade in Skt. *ásta-*, Avest. *asta-* 'homeland; home'), OIcel. *nest* 'food for travel', OHG *nerī*, *nara* 'salvation, food' (Ger. *Nahrung*), etc.: see Watkins 1971:1499, 1531.

***bhraHther-** 'brother; G⁰ consanguineal relative; male member of extended family of G⁰ level': Toch. A *pracar*, B *procer*, Skt. *bhrātar-* 'brother' (cf. Vedic *bhrātṛtvā-* 'brotherhood; cooperative group of male consanguines of the same generation' and Russ. *bratvá* 'group of friends'); Avest., OPers. *brātar-* 'brother', Oss. *ærvad* 'member of same clan; relative', Arm. *ełbayr* 'brother', Gk. (Ion.) *phrēiēr* 'brother', 'adelphós', (Att.) *phrátēr* 'member of phratry, group of friends, or brotherhood',³⁸ Lat. *frāter* 'brother', OIr. *bráth(a)ir* 'brother; member of extended family', Goth. *brōþar*, OIcel. *bróðir*, OHG *bruoder* (Ger. *Bruder*), OE *brōþor* (Engl. *brother*), OPruss. *brāti* 'brother', Lith. *broterėlis*, OCS *brat(r)ŭ* 'brother'.³⁹

This Indo-European word can best be reconstructed as a classificatory term, one which denoted not just a brother in the strict sense but any male member of the extended family belonging to ego's generation. Consequently it could refer to a brother proper or to a father's brother's son, since both belonged to the same extended family (see Benveniste 1969:I.214, Abaev 1949:I.62-63, Trubačev 1959:59, 66).

PIE ***šoesor-** 'sister; female member of extended family belonging to ego's generation': Toch. A *šar*, B *šer* 'sister', Skt. *svásar-* 'sister' (cf. Vedic *svasṛtvā-* 'sisterhood, cooperative group of female relatives of the same generation'), Avest. *xvaŋhar-* 'sister', Oss. *xoæraæ* (*xo*) 'any woman of my clan' (Abaev 1949:I.62-63), Arm. *k'oyr* 'sister', Gk. *éor* 'daughter, female cousin, female relative', 'thugátēr, anepsiós, prosēkontes'⁴⁰ (see Gates 1971:38), Lat. *soror*, OIr. *siur*, Goth. *swistar*, OIcel. *syster*, OE *sweostor* (Engl. *sister*), OHG *swester* (Ger. *Schwester*), OPruss. *swestro*, OCS *sestra*.

The meaning of ***šoesor-** is reconstructed as 'sister; any G⁰ female consanguine; female member of extended family'. This meaning allows the word to be reconstructed as a compound consisting of ***swe-** (archaic ***šoe-**, with a labialized sibilant: see Szemerényi 1964:313ff.) plus ***sor-** 'woman'.⁴¹ Hence ***šoe-sor-** originally meant 'one's own woman', i.e. 'woman of one's own clan or family' (see Otrębski 1967; differently, Normier 1980a:48ff.).⁴²

In ancient Indo-European society a woman remained 'one's own', a member of one's extended family, until she married, whereupon she entered another

38. For the meaning 'brother (in the strict sense)' Greek has a neologism: *adelphós* (Gates 1971:38).

39. The Hittite cognate is unattested, hidden by the Sumerogram ŠEŠ: nom. sg. ŠEŠ-aš, acc. ŠEŠ-an, dat.-loc. ŠEŠ-ni. For Luwian the word *nani-* is attested for 'brother', evidently a word from child language.

40. For the meaning 'sister (in the strict sense)' Greek has the neologism *adelphéa*.

41. Compare the element ***sor-** as a marker of feminine gender in such forms as Skt. *tisrá-* 'three' (fem.), Hitt. *ḫaššu-šara-* 'queen' beside *ḫaššu-* 'king'; cf. also Skt. *strī* 'woman' from **srī*.

42. The form ***šoe-** is traced by Szemerényi (1977a:391) to an original Indo-European ***sū-** 'extended family'.

family and formed new, affinal kinship relations outside of her birth family. ***šoe-sor-** and ***bhraHther-** both denote consanguineal kinship relations within the extended family and are hence parallel as regards taxonomic semantics, but ***šoe-sor-** differs from ***bhraHther-** in designating a relation terminated by marriage.

In the Anatolian languages ***šoe-sor-** is replaced by innovations such as Hitt. *neka-* 'sister' (also 'daughter', 'female consanguine': Otten 1973:35-36, Neumann 1974), Luw. *nana-š(a)ri-* 'sister' (Dunaevskaja 1966).⁴³

7.7.2. Consanguineal kinship terms of ego's parents' generation (G-1)

PIE ***phHther-** 'father': Toch. A *pācar*, B *pācer*, Skt. *pitár-*, Avest. *pitar-*, Arm. *hayr*, Gk. *patēr* (see Gates 1971:5ff.), Lat. *pater*, OIr. *athir*, Goth. *fadar*, OE *fæder* (Engl. *father*), OHG *fater* (Ger. *Vater*).⁴⁴

PIE ***maHther-** 'mother': Toch. A *mācar*, B *mācer*, Skt. *mātár-*, Avest. *mātar-*, Arm. *mayr*, Gk. *metēr*, Lat. *māter*, OIr. *máthir*, OHG *muoter* (Ger. *Mutter*), OE *mōdor* (Engl. *mother*), Latv. *māte*, OPruss. *mūti*, *mothe*, OCS *mati*.⁴⁵

7.7.3. G+1 consanguineal kin terms

PIE ***suyo-/sūnu-** 'son; male descendant': Toch. A *se* 'son', *seya-ši* 'pertaining to son', *sewā-ši* 'pertaining to sons', B *soy*, gen. *seyi*, Gk. *huiús*, *huiós* (Gates 1971:11), Arm. *ustr* 'son' (by analogy to *dustr* 'daughter'); Skt. *sūnú-*, Avest. *hunuš*, Goth. *sunus*, Olcel. *sunr*, OE *sunu* (Engl. *son*), OHG *sunu* (Ger. *Sohn*), Lith. *sūnūs*, OCS *synŭ*.⁴⁶

The Indo-European words for 'son' are etymologically related to the root ***seuH-/suH-** 'give birth': cf. Skt. *sūte* 'gives birth', *sutá-* 'son; born', Avest.

43. Čop 1979:21 suggests that Hitt. *neka-* 'sister' should be considered an archaism reflecting Indo-European-Uralic connections.

44. The Anatolian languages replace the ancient Indo-European word with words from baby talk: Hitt. *attaš*, Luw. *taiš*, Pal. *papaš* 'father'. Analogous replacements are found in a number of other Indo-European languages, in particular Slavic (OCS *otĭcĭ* 'father', Russ. *tĭatja*, *tata*, etc.: see Trubačev 1959:25ff.) and probably Baltic: OPruss. *tāws*, Lith. *tėvas*, Latv. *tēvs* (Mühlenbach and Endzelin 1923-1932: IV.176). Slavic retained traces of the stem ***phHther-** up to historical times, as is shown by ORuss. *stryi* 'uncle on father's side; father's brother', a derivative in *-u- of that stem; cf. also ORuss. *Stribog*, deity name, a compound based on the same stem.

45. The Anatolian languages replace the original word for 'mother' with children's words: Hitt. *anna-*, Luw. *anni-* 'mother'.

46. The corresponding word for 'son' in Hittite is hidden by the Sumerogram DUMU.DUMU-aš (nom.); cf. also the Sumerogram DUMU-la-, which is interpreted as a form of non-Indo-European origin, *ayawala-* 'son' (Melchert 1980).

hav- 'give birth'. The Indo-European word for 'son' is formed from this root by suffixation of **-n-* or the thematic vowel: **su(H)-o-*/**su(H)y-o-* and **su(H)-nu-*: see Szemerényi 1974:320, 1977b:1 lff., Trubačev 1959:48ff.

PIE **d^hugh^hīther-* 'daughter; female descendant': Toch. *A* *ckācar*, *B* *tkācer*, Skt. *duhitār-*, Avest. *dugādar-*, *duγdar-*, Pers. *duxtār*, *duxt* (cf. *dukšiš* 'daughter, wife' in Elamite, from OPers. **duxθri*:⁴⁷ see Benveniste 1966b:43-48), Arm. *dustr*, Gk. *thugátēr* (Gates 1971:11), Osc. *futír*, Goth. *daúhtar*, OHG *tohter* (Ger. *Tochter*), OE *doh^htor* (Engl. *daughter*), OPru^hs. *duckti*, Lith. *duktė*, OCS *dŭšti*:⁴⁸ for the etymology see II.3.1.3.3n41 (but for another interpretation see Szemerényi 1977a:387ff.).

7.7.4. *G-2 consanguineal kin terms*

PIE **Han-* 'grandmother; father's mother': Hitt. *ḫannaš*, dat.-loc. *ḫanni* 'grandmother' (cf. the Hittite goddess name *Ḫannaḫanna-*, reduplicated), Lyc. *χῆῆνα* 'mother(?)' (Pedersen 1945), Arm. *han* 'grandmother', Gk. *annís* 'grandmother; mother's or father's mother' (*patròs ē mètròs méiēr*), Lat. *anus* 'old woman; sybil; prophetess', OHG *ana* 'grandmother', Lith. *anýta* 'husband's mother' (Delbrück 1889:451, Benveniste 1969:I.224, P. Friedrich 1966:5-6, Gates 1971:54). In view of the complete lack of terms for the wife's consanguineal kin, we can conclude that the original meaning of PIE **Han-* was 'husband's mother' (from the wife's viewpoint) or 'father's mother' (from the son's viewpoint). This meaning is preserved in Lith. *anýta* 'husband's mother' (Fraenkel 1962-1965:I.10).

PIE **HauHo-* 'grandfather; father's father': Hitt. *ḫuḫḫa-* 'grandfather', *ḫuḫḫant-* 'grandfather; ancestor' (pl. *ḫuḫḫanteš* 'ancestors'), *ḫuḫatalla-* 'pertaining to grandfather' (adj.), cf. also *ḫuḫḫa-ḫanniš* 'grandfathers and grandmothers', i.e. 'ancestors'; Arm. *haw* 'grandfather', Lat. *auus* 'grandfather; ancestor', cf. OIcel. *a^hfi* 'grandfather', a derivative of the same root.⁴⁹

47. The Elamite form evidently reflects replacement of the accessive sequence **-kt-* of the Iranian form by *-kš-* (for elimination of accessive clusters in individual Indo-European dialects see I.2.6.3 above).

48. The Hittite word for 'daughter' is always rendered with the Sumerogram DUMU.SAL, whose Hittite reading is unknown. The reflex *cbatru* 'daughter' in Lycian (see Benveniste 1969:I.257) suggests that cognate forms may have survived in other ancient Anatolian languages, most likely Luwian.

49. In some Indo-European dialects a word derived from **HauHo-* means 'grandson', e.g. OIr. *áue*, Mlr. *óa*. This and similar facts (e.g. OHG *eninchil* 'grandson', Ger. *Enkel*, diminutive of *ano* 'grandfather' like the cognate Lith. *anūkas* 'grandson' and Slavic *vūnukū*: see Benveniste 1969:I.234) can be explained by the widely attested practice of inverse naming, whereby the older and younger people in a kin relation (grandparent and grandchild, parent and child) call each other by the same term (the term applied to the younger person by the older is frequently diminutive). An example is Georgian *babuk'a* 'grandfather', *bebik'o* 'grandmother' which can be applied by the grandparent to the grandchild, or *mamik'o* 'daddy' and *dedik'o* 'mommy' which can be applied to children by parents.

7.7.5. The meaning and interrelation of ***HauHo-** and ***nep̥hōth-**; cross-cousin marriage among the ancient Indo-Europeans

That the original meaning of ***HauHo-** was 'father's father' (and not 'mother's father' as Delbrück 1889:482 claimed) is most clearly supported by Hittite data, where *ḫuḫḫa-* denotes paternal ancestors as in the sequence *attalla-ḫuḫatalla-* 'father's (and) grandfather's' (adjectives), *ḫuḫḫanteš* 'grandfathers; ancestors; fathers' (Benveniste 1969:I.226).⁵⁰ Latin authors define *auus* as *pater patris* 'father's father'; cf. also the definition *patris mei pater auus meus est* 'my father's father is my *auus*' (Benveniste 1969:I.226).

This conclusion is consistent with the general distribution of kinship terms in the Indo-European family, where terms for the husband's relatives are attested while terms for the wife's relatives are not. The wife's relatives appear in the system only from the viewpoint of her son (and not her husband): the son is called ***su(H)-nu-** by his mother (***maHther-**) and father (***ph̥Hther-**), and ***nep̥hōth-** 'grandson'⁵¹ by his paternal grandfather (***HauHo-**).

HauHo-**, 'paternal grandfather' from the viewpoint of the grandson (nep̥hōth-**), also has the meaning 'maternal uncle, mother's brother' in some dialects: OPruss. *awis* 'maternal uncle', Lith. *avýnas* 'maternal uncle', Slavic **ujī* 'maternal uncle' (Trubačev 1959:81-84, Toporov 1975-:I.179-80), Lat. *auunculus* 'maternal uncle, mother's brother' (an affectionate term derived from the root of *auus* 'grandfather'), Bret. *eontr* 'uncle', OE *ēam* 'uncle', cf. OHG *ōheim* 'uncle'.⁵² These forms, from various dialects, allow us to reconstruct for ***HauHo-** and its derivatives the meaning 'mother's brother; maternal uncle' as well as 'father's father', just as the meaning reconstructed for ***ph̥Hther-** and its derivatives includes both 'father' and 'father's brother'. Similarly, from the viewpoint of the paternal grandfather and maternal uncle, ***HauHo-**, the grandson (son's son) and nephew (sister's son) are called by the same term

50. Thus the meaning of Lyc. **xuga* 'maternal grandfather' must be regarded as a recent innovation: see also Pokorny 1959:89.

51. PIE ***nep̥hōth-** 'grandson' is reflected in the historical dialects as Skt. *nāpāt* 'grandson, descendant', Avest. *napāt-*, *naptar-*, OPers. *napāt-*; Hom. Gk. *népodes* 'descendants' (see Gates 1971:21), Lat. *nepōs* 'grandson', OLith. *nepuotis* 'grandson'; cf. derivatives in ***-ī** meaning 'granddaughter': Skt. *naptī-* 'granddaughter, female descendant', Lat. *neptis* 'granddaughter', OLith. *neptė* 'granddaughter'. The word is etymologized as ***ne** + **phōth-is** 'not dominant, not independent' (see Vasmer 1953 [1964-1973:III.68], Pokorny 1959:764). The original sense must have been a social one: 'young unmarried male member of extended family, not head of family', contrasting with ***phōth-** 'head of family, husband'. In this sense ***ne-phōth-** is the negation of ***phōth-** (see Pokorny 1959:764).

52. In contrast to the maternal uncle, whose name is derived from 'grandfather', the paternal uncle is referred to by a derivative of ***ph̥Hther-** 'father': PIE ***ph̥Hthruwio-**, Lat. *patruus* 'paternal uncle', OHG *fetiro*, *faiirro*, *fatureo*, OE *fædera* 'paternal uncle', ORuss. *stryi* 'paternal uncle'.

***nephōth-**.⁵³ The kinship terms are summarized in Table 4.

Table 4
Consanguineal kinship terms

Relation	PIE term
Father	*ph₂H₁ther-
Mother	*maH₁ther-
Brother	*bh₂raH₁ther-
Sister	*s₁oesor-
Son	*suH₁nu-
Daughter	*dh₁ugh₂H₁ther-
Father's father	*HauHo-
Father's mother	*Han-
Mother's father	—
Mother's mother	—
Father's brother	*ph₂H₁thruwio-
Mother's brother	*HauHo-
Father's sister	—
Mother's sister	—
Brother's son	*suH₁nu- (?)
Sister's son	*nephōth-
Brother's daughter	*dh₁ugh₂H₁ther- (?)
Sister's daughter	—
Son's son	*nephōth-
Daughter's son	—
Son's daughter	*nepht₁i
Daughter's daughter	—

53. Cf. PIE ***nephōth-** in the meaning 'nephew, sister's son': MLr. *nīx*, gen. *nīath* 'sister's son', Serbo-Cr. *něčāk* 'nephew, sister's son', OCS *netijl* 'nephew', Alb. *nip* 'grandson, nephew', OHG *nevo* 'nephew, male relative', OE *nefa* 'nephew, grandson', OIcel. *nefe* 'nephew, male relative'; cf. also OIr. *necht* 'niece', OHG *nift* 'niece' (Ger. *Nichte*), RChSl. *nesterā* 'niece, sister's daughter', Alb. *mbésë* 'niece' < ***nephot₁iā**; cf. also Gk. *a-nepsiós* 'brother's or sister's son'.

On the other hand, a brother's son (unlike a sister's son) was referred to by the same word as a son, ***su(H)-nu-**: cf. Serbo-Cr. *sinovac* 'brother's son' (see Gates 1971), OE *suh₁terga* 'nephew'. Objections raised against reconstructing 'nephew' as one of the meanings of ***nephōth-** (see Beekes 1976) are not convincing. For one thing, it would be difficult to explain the independent development of this meaning in a large number of dialects (Germanic, Slavic, Celtic, Albanian, Latin, and possibly also Greek with *anepsiós* 'nephew'). For another, the fact that Lat. *nepōs* is attested with the meaning 'nephew' only relatively late, since the second century A.D. (earlier texts use the descriptive phrase *fratris filius* 'brother's son', *sororis filius* 'sister's son': see Szemerényi 1977b:62), may indicate simply that the polysemous *nepōs* 'nephew; grandson' was replaced by an unambiguous expression in texts of a historical and legal character. Subsequently, *nepōs* is found in both meanings 'grandson' and 'nephew' in documents of various genres.

The fact that individuals bearing different kinship relations are called by the same term — father's father and mother's brother, grandson and sister's son — can be explained if we assume that they were functionally identical from ego's viewpoint. This reconstructed system points to a close consanguineal relation between the father's father and mother's brother, as is possible in a dual-exogamous cross-cousin marriage system, where a man can marry his mother's brother's daughter or father's sister's daughter, both of whom belong to the other lineal group (for Indo-European see Hocart 1928, Benveniste 1969:I.226-29, Szemerényi 1977a:399ff.).⁵⁴

7.7.6. *The general system and terminology of marriage and kinship relations*

The Indo-European system of marriage and kinship relations can be represented as in Figure 4 below. The kin relations can be summarized as follows:

A: ***HauHo-** 'grandfather' to G and H, I and J

***phHther-** 'father' to C, D, E

***šœk̑huro-** 'husband's father' to D' and F

***HauHo-** 'maternal uncle' to C'

***bhraHther-** 'brother' to B'

***photh-** 'husband' to B

B: ***Han-** 'grandmother' to G and H, I and J

***maHther-** 'mother' to C, D, E

***šœk̑hruH-** 'husband's mother' to D' and F

***k'œn-** 'wife' to A

B': ***maHther-** 'mother' to C' and D'

***šœesor-** 'sister' to A

***k'al(ou-)** 'husband's sister' to B

C: ***phHther-** 'father' to G and H

***photh-** 'husband' to D'

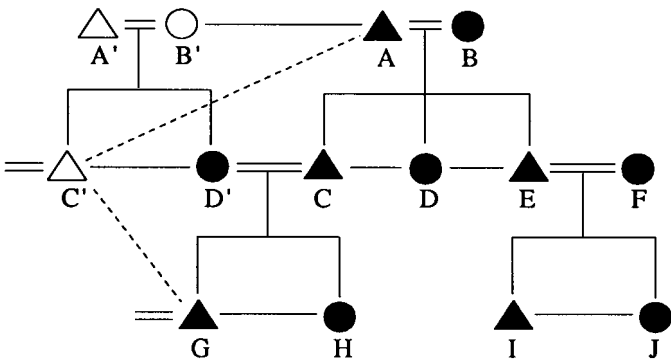
***bhraHther-** 'brother' to D and E

***t'aiwēr-** 'husband's brother' to F

***suHnu-** 'son' to A and B

54. Objections raised to this claim — the lack of a special term for 'cross cousin' and terms for affines of the female line (P. Friedrich 1966:27-28) — are not convincing. The lack of terms for maternal affines (including cross cousins) is due to the system of kinship acquired by marriage, whereby a woman who marries leaves her birth family and thereby breaks off her kin relations to it. Only in the next generation can a female cross cousin, who, as a member of another family, has no kinship standing in her mother's birth family and hence is not designated by a kin term, enter her mother's birth family as a wife.

Figure 4



Legend

- △ Male
- Female
- = Marriage
- Sibling relation
- | Descent
- Consanguineal relationship through a sister who has entered another family

Empty and filled symbols indicate two different lineal groups.

Examples:

- △ = ○ △ is ○ 's husband (*photh-)
 ○ is △ 's wife (*k'o'en-)
- △ — ○ △ is ○ 's brother (*bhraHther-)
 ○ is △ 's sister (*soesor-)

C': ***HauHo-** 'maternal uncle' to G and H

***bhraHther-** 'brother' to D'

***suHnu-** 'son' to A' and B'

***nephōth-** 'sister's son' to A

D: ***šoesor-** 'sister' to C and E

***k'al(ou-)** 'husband's sister' to F and D'

***dhughHther-** 'daughter' to A and B

D': ***maHther-** 'mother' to G and H

***k'oēn-** 'wife' to C

***snuso-** 'daughter-in-law' to A and B, 'sister-in-law' to E and D

***(y)enHther-** 'husband's brother's wife' to F

***šoesor-** 'sister' to C'

E: ***phHthruwio-** 'paternal uncle' to G and H

***bhraHther-** 'brother' to C and D

***t'aiwēr-** 'husband's brother' to D'

G: ***bhraHther-** 'brother' to H

***bhraHther-** 'brother, cousin' to I and J

***suHnu-** 'son' to D' and C

***suHnu-** (?) 'son' to E

***nephōth-** 'nephew' to C'

***nephōth-** 'grandson' to A and B

H: ***šoesor-** 'sister' to G

***dhughHther-** 'daughter' to D' and C

***dhughHther-** (?) 'daughter; brother's daughter' to E

***nephth-ī** 'granddaughter' to A and B

C can marry D', his father's sister's daughter. Her brother C' is thus both nephew and son's wife's brother to A. D's son G is the grandson of her uncle A (who is also her husband's father), and her brother C' is her son G's uncle. Therefore, for G his maternal uncle C' is in some respects identical to the grandfather A, who is G's father's father and the maternal uncle of G's maternal uncle C'. Thus the maternal grandfather A is a sort of double maternal uncle.

The paternal grandfather A and the maternal uncle C', for whom A is himself maternal uncle, both call G, who is respectively their grandson and nephew (sister's son), by the same word.

Meanwhile the grandfather's sister B', married to A', has left to enter another family, and C' and D', the children of that marriage, belong to the other family

until the daughter D' marries her cross-cousin C and thus returns to the grandfather A's family. These symmetrical marriage relations show how women were exchanged between two clans or families. Each of the women D and H in the first family must leave her family on marrying and enter another in return for a woman from the latter family; the two families are linked by dual marriage relations. As a result, complex affinal and consanguineal relations arise between the families or clans exchanging women; when such affinal and consanguineal relations among various families or clans are superimposed on each other, the ties between moieties (or other forms of social organization) are strengthened.

7.7.7. Early consanguineal relations as a dual-exogamous system

Consanguineal relations involving dyadic exogamous units exchanging women while the male descendants remain within their respective lineal groups result in the growth of individual families into units larger than the individual house (*t'om-). Over the course of a few generations the family grows into an extended family comprising several married couples at each level of male descent, all living together with their children under the same roof. With further growth the extended family can split into separate families which are united into a clan or phratry by their patrilineal descent. PIE *k'en-o- (Skt. *jána-* 'clan, kin group; birth, birthplace', Gk. *génos* 'clan, kin group; birthplace', Arm. *cin* 'birth', Lat. *genus* 'clan, kin group; descendants of one ancestor', etc.: see 7.4.1) may have designated just such a grouping of families sharing a common patrilineal descent.

As the number of such clan groupings increased, the original dyadic exogamous units would have split into new dyadic units and expanded their territory, which would ultimately lead to the rupture of former kin ties between separate clans and clan groupings. In such conditions, with further development the kinship system preserves traits of the earlier dual-exogamous organization and individual kin terms and relations which conform to the Omaha type of kinship system (see Lounsbury 1964, Gates 1971:39-50, Barlau 1976, Soselia 1979).

7.7.8. Relations between nephews and maternal uncles in a dual-exogamous system, and traces of such relations in ancient Indo-European traditions

As was explained above, the distinctive treatment of the maternal uncle in the Indo-European kinship system and the fact that he could be referred to by a diminutive of *HauHo- 'grandfather' (Lat. *auunculus*, etc.) are explained by positing a cross-cousin marriage system. This situation finds typological

parallels in the kinship systems of a wide variety of ethnic groups and can be regarded as an ethnological universal ultimately motivated by a particular system of consanguineal kinship relations. In many societies the relation of maternal uncle and nephew is complementary to or otherwise dependent on that of father and son: if relations between father and son are strict, those between maternal uncle and nephew are close and warm; and conversely (see Lévi-Strauss 1958, 1964a:45ff.).

The special relation reconstructed for nephew and maternal uncle in the Proto-Indo-European kinship system can still be observed, albeit with some reshaping, in individual early Indo-European traditions. For Old Hittite society the special status of the sister's son can be seen in the testament of Hattusilis I (early 17th century B.C.) depriving his sister's son of succession to the throne and appealing to future kings not to raise their sisters' sons; in the Akkadian text: DUMU SAL+KU *ma-am-ma-an ú-ul ú-ra-ab-ba* 'let no one bring up his sister's son' (HAB 2 I/II 9). This shows that Hattusilis's nephew had originally been designated heir to the throne, and it probably testifies to an ancient system of inheritance preserved by the Hittites until historical times⁵⁵ (see Menabde 1965:216). It is a reflex of the special status of the sister's son in the Proto-Indo-European social system.

Sanskrit tradition as early as the Rigveda reflects traces of special respect for the maternal uncle (Hocart 1925). In connection with a rite concerning the maternal uncle's daughter, the hymn RV X, 35, 7-8 mentions that she is a man's 'share, portion' (*bhāgá-*). Interestingly, Skt. *mātulá-* 'maternal uncle', derived from the root of *mātár-* 'mother', is an Indo-Aryan and Kafir innovation which replaced the original Indo-European word for 'maternal uncle' based on ***HauHo-** (for Kafir cf. Ashkun *maú*, Waigali *mól*: Morgenstierne 1954:275). Sanskrit preserves the special significance of the kin relation in question but changes the identifying feature: instead of being identified with the grandfather, the maternal uncle is connected with the mother in the Sanskrit nomenclature.

An analogous picture is revealed by the Homeric Greek tradition, which preserves a special emotional closeness between nephew and maternal uncle (*métrōs*). In the Iliad (16:715-20), Apollo appears to Hector in the form of his maternal uncle (*métrōs*) in order to make a greater impression on him, which testifies to the special authority of the mother's uncle for the nephew. The Greek term, like the Sanskrit one, is derived from 'mother'.

In ancient Roman tradition, the special status of the maternal uncle and its similarity to that of the grandfather are preserved until classical times. This is

55. Interestingly, Hattusilis himself, at the beginning of his chronicle (KBo X 1, 2, 3), calls himself 'the son of Tawananna's brother' (i.e. 'queen's brother's son'); in the Akkadian text: *šarru rabū ta-ba-ar-na i-na URUḪattiū šarru-ut-ta i-te-pu-uš ša SALta-wa-an-na-an-na māru aḫi-šu* 'the great king Tabarnas held the kingship in Hattusas, being the son of Tawananna's brother'.

visible both in the term for 'maternal uncle' *auunculus*, etymologically transparent (to the Romans themselves)⁵⁶ as a diminutive of *auus* 'grandfather', and in the Roman institution of the avunculate.

For Celtic, Old Irish myth reflects the close link between the hero Cuchulain and his mother's brother Conchobar. According to Livy (*Ab urbe condita* V.39), the Gaulish king Ambicatus sent two sons of his sister (*sororis filios*) to take part of the tribe to new territory in order to reduce the excessive population (and presumably also in order to create a new exogamous unit required for the continuation of the clan).

In Germanic tradition, according to Tacitus (*Germania* XX.5), *sorum filiis idem apud auunculum qui ad patrem honor* 'a sister's sons respect the maternal uncle just as they do their father'. This is consistent with the evidence of Old English epic verse and medieval poetry: Beowulf has special regard for his maternal uncle Hygelac, as does Gawain for his maternal uncle Arthur (Cummerc 1901).

Slavic tradition preserves the special relations of nephew to maternal uncle characteristic of the avunculate (see Bremmer 1976) from ancient times to the present day. Among the southern Slavs, especially in Serbia and Montenegro, respect for the maternal uncle, sometimes exceeding that for the father, is found in a number of wedding, funeral, and other rites (Gasparini 1973:277-97).

7.7.9. *The reorganization of the ancient affinal kinship system and loss of the patrilocal principle in the separate Indo-European traditions*

The complex ancient Indo-European system of affinal kinship relations is ultimately based on one essential feature: binary exogamous patrilocal marriage, with all marriageable women eventually leaving their own families upon marriage to assume membership in another, and women from that family marrying into the first. Disruption of the patrilocal principle, whereby women entered the family and descent was preserved within it along the male line, would obviously have led to radical changes in the inherited affinal kinship relations and destruction of the original conceptions of family and clan.

This is precisely what took place in the individual Indo-European traditions, particularly in Anatolian. The institution of *antiyatar*, 'entry of the son-in-law (*antiyanza*) into the wife's family', had arisen by the time of the Old Kingdom. The very term for 'son-in-law', *antiyanza*, is a compound *anda* + *iyant-* 'entering in', 'coming into the house', and designates a son-in-law taken into the

56. Significantly, the Roman authors themselves define *auunculus* as 'my mother's brother' (*matris meae frater*) and regard the maternal uncle as so named because he 'stands in a third-degree relationship to me, just as my grandfather does' (*traxit appellatorem ab eo quod ... tertius a me, ut auus ... est*: Festus).

bride's home.⁵⁷ This probably arose under the influence of the Akkadian marriage custom of *errēbu*, where the husband settles in the wife's house (see Imparati 1964:218ff., Balkan 1948). This kind of marriage is widespread in Asia Minor and the Caucasus to the present day: cf. Turkish *içgüveylik* (from *iç* 'in' + *güvey* 'son-in-law'), typologically parallel to Georgian *časizeba* (from *ča-* 'in' + *siže-* 'son-in-law').

Uxorilocal marriage, diametrically opposed to the reconstructed Indo-European principles, gradually becomes stronger in Old Hittite tradition and receives legal standing in Hittite law. It is significant that according to Telepinus's law of succession (16th century B.C.), §§29, 36, if the king has no son and no direct heir the husband of the first (oldest) daughter is to be taken into the royal house and made king: *nu-uš-ši-iš-ša-an* *LUan-ti-ya-an-ta-an* *ap-pa-a-an-du nu* *LUGAL-uš a-pa-a-aš ki-ša-ru* 'and let them take her husband, and let him become king'.

This departure from the fundamental principle of the Proto-Indo-European affinal kinship system naturally produces major changes in the kinship networks of the daughter traditions, especially Hittite. This must be one of the reasons for the almost complete replacement of the Proto-Indo-European kin terms in Anatolian, which forms new derivations based on Indo-European words, typically from child language, and borrows words from neighboring languages.

57. Note also the expression *na-an* *LUan-ti-ya-an-ta-an e-ip-zi* 'and (he) takes him as a son-in-law' (Hittite Laws, §36, 28).

Chapter Eight

The connection of ancient social organization with intellectual constructs and the mythological view of the world

8.1. The dualistic principle of Indo-European social organization and its reflection in rituals and mythology

8.1.1. The binarism of religious and mythological views

Ancient Indo-European society was organized on a dual basis grounded in the dual nature of marriage and affinal relations whereby women were exchanged between the two consanguineally related halves of the society. This organization strongly influenced the spiritual life of the Indo-Europeans, resulting in binarism in many areas of religious and mythic thought and in several aspects of the Indo-Europeans' model of the natural world. One of the clearest examples is the binary nature of the ancient Indo-European classification of flora and fauna discussed in Chapter 1 of Volume II. The same binarism characterizes Indo-European mythological and religious conceptions, fragments of which can be reconstructed by applying the comparative method to the data of individual historical cultures.

8.1.2. Two tribal leaders as an ancient Indo-European conception

One area of mythological and ritual conceptions where this binarism appears is in the reconstructed Proto-Indo-European belief in two mythological kings who were tribal founders. This belief is still visible in the custom found in several early Indo-European tribes of jointly honoring two kings or two tribal or clan leaders who functioned together.

The catalog of ships in Homer's *Iliad* lists a number of joint rulers or leaders of cities or regions. Later, a custom of joint kingship, a dual power of sorts, is attested in the government of Sparta (Herodotus, *Histories* VI.56). The ancient Germanic peoples manifest this tradition in the Anglo-Saxon legend of the two leaders Hengist and Horsa who headed the settlement of Britain (see II.3.1.1.9 above, and Ward 1968:54 et pass.). Traces of analogous dual kingship have been found in ancient India (Hocart 1970:167-68ff.).

8.1.3. *The Indo-European twin cult*

Another manifestation of the binary conception of society and the world is the cult of twins widespread in Indo-European mythology. A myth of divine twins who are children of the sun god goes back to Proto-Indo-European antiquity. The myth is found in all the main ancient Indo-European traditions, which not only repeat the same motifs but also share correspondences in the names of the heroes, thus establishing the Proto-Indo-European character of the motif and the personages. The twins are called 'children of god' or 'children of the sun': Vedic Skt. *Divo napātā* (du.) 'two descendants of the sky god (*Dyáuḥ*)', Hom. Gk. *Dioskoúroi* 'the Dioscuri, children of Zeus', Lith. *Diēvo sūnēliai* 'children of god', Latv. *Dieva dēli* 'children of god' (see de Vries 1957:II.244ff.).

The supreme deity of the ancient Indo-Europeans, whose children are the divine twins, is known as 'sungod father', *t'yeu(s)-ph₂H₃ther-: Skt. *Dyáuḥ pitṛ*, Gk. *Zeû páter* (voc.), Lat. *Iūpiter, Diēspiter*, Umbr. *Iupater* (cf. Luw. *tatiš tiwaz*), Pal. *tiyaz ... papaz* 'sungod father' (with replacement of the second element) and ORuss. *Stribog*'' (with replacement of the original first element by *bog*'' 'god' and reversal of the two elements), cf. Hitt. *attaš Ištanuš* 'father sungod' (where *Ištanuš* is a loan from Hattic).

In the Indo-European myth the children of the sungod take care of their sister, the daughter of the sun, whose name also coincides in the major traditions: Skt. *duhitā sūryasya* 'daughter of the sun', Lith. *saulės duktė*, Latv. *saules meita* (Ward 1968). Various traditions also share the motifs of the twins riding on 'horses of the sun' and in a boat on the sea. In Indic tradition the divine twins are called *Aśvínau* because of their ritual connection with horses (Skt. *ásva*-).

8.1.4. *The Indo-European myth of the twins' incest*

Incest between the twins occurs in different variants of the myth: the twins are brother and sister who found the human race. This is clearest in the Indo-Iranian myth of Yama, a late echo of which is preserved in the dialog between Yama, the first human, and his sister Yami, who tries to persuade him to commit incest¹ (RV X, 10): see Schneider 1967, Humbach 1974. The Indic name *Yamá-* goes back to the Proto-Indo-European word for 'twin', archaic PIE *q'emo-: Skt. *yamá-* 'twin', Avest. *yāma-* 'twin', Lat. *geminus* 'twin', Mlr. *emuin* 'twin', Latv. *jumis* 'double fruit, double head of grain; agricultural

1. An analogous motif of blood mixture is found in other Indo-Iranian traditions, both as a mythologeme in the Ossetic Nart epos (the seduction of Satana by her brother Uryzmag) and as a custom permitted by Zoroastrian religion, which regarded marriage between close relatives such as brother and sister to be the highest form of marriage (see Dumézil 1976:79-80, 246).

deity'; see Ernout and Meillet 1967:268-69; also Güntert 1923:334ff. Echoes of this motif can also be detected in an Old Hittite myth about twins, in which the queen Kanesa bears thirty twin sons who marry their thirty sisters (Otten 1973): *nu-uz-za DUMU.SALMEŠ.ŠA A.NA DUMU.NITAMEŠ.ŠA pa-iš* 'and she [i.e. their mother — AMA.ŠU.NU] gave her daughters in marriage to her sons' (KBo XXII 2, 16). The archaic nature of this theme in both the Hittite and Indic myths is evident in the moral disapproval of incest which forms the basic theme of the story: in the Indic myth Yama disapproves incest with his sister, who tries to tempt him, and in the Hittite myth the youngest brother says *nu le-e ša-li-ik-tu-ma-ri [Ú.UL] a-a-ra* 'and don't sin; it isn't righteous!' (19) (see Haas 1977:14ff.).²

In the Celtic myth, as in the Hittite one, there are more than two twins: there are three twin brothers and a sister, who persuades her brothers to sleep with her so she will not be childless (Dumézil 1971:346-47).

The archaic motif of incest between brother and sister can be regarded as a retention in the mythic world of a prototype of legally sanctioned marriage between cross cousins, i.e. between a man and the daughter of his father's sister or mother's brother. It must be assumed that originally each of the twins symbolically represented his or her 'half' of the tribe, which entered into marriage and affinal relations with the other half.

8.1.5. Dualistic rituals in individual Indo-European traditions

With further social development and increasing complexity of social relations, the original dualism of early Indo-European social structure came to be seen as something symbolic and was transferred to myth and ritual as an echo of the ancient social structure. This mythic and ritual dualism can be clearly traced through the individual ancient historical Indo-European traditions. The Hittites preserved a ritual (KUB XVII 35 III 9-14, see Kümmel 1967:161) where men capable of bearing arms were divided into two groups ('halves', Hitt. *takšan*), arbitrarily called 'people of Hatti' and 'people of Masa'. The first carried

2. It has been claimed that the Hittite queen Tawananna was not the mother of the reigning person but his sister and married to him (see Bin-Nun 1975). In view of what has been presented above concerning the ancient practice of brother-sister marriage, such a relation between Tawananna and the Hittite king would not be unexpected, but the concrete evidence for this conclusion requires further verification. The fact that the king calls the inheritor of his throne, Tawananna's son, DUMU.NIN 'sister's son' does not conclusively prove that he was married to Tawananna, since, as has been established, the successor to the throne in Old Hittite society could be the king's sister's son.

Typologically, brother-sister marriage in socially developed groups should be regarded not as the direct continuation of an ancient marriage custom, but rather as a reminiscence or return to it among the highest ranks of a caste-stratified society, who strove for dynastic purity. Compare the brother-sister marriage of the imperial family of the Egyptian pharaohs, of the Peruvian Incas, of the Hawaiians, and others (see Zolotarev 1964:191-93 et pass.).

bronze weapons, the second reed weapons. In the ritual the 'people of Hatti', with their bronze weapons, defeat the 'people of Masa' and dedicate a captive to the god (see Ardzinba 1982:80ff.).

Sanskrit epos and legend reflect a myth cycle about the rivalry of two phratries, the Kauravas and the Pandavas (G. Held 1935, Bosch 1960:86-87, Zolotarev 1964:217) and two dynasties, the Sun Dynasty and the Moon Dynasty (see Hocart 1970).

The social basis of mythic and ritual dualism is especially clear in ancient Roman tradition, which preserved the rite Lupercalia until the end of the republic. The rite involved ritual rivalry of two groups which bore the names of two clans (*gentes*), the Fabii and the Quintilii (Dumézil 1966:565). According to the myth of the founding of the Luperco priesthood, the two groups were headed by the two twin founders of Rome: the Fabii by Remus and the Quintilii by Romulus. The myth of Romulus and Remus itself can be interpreted as a reflection of ancient conceptions based on the dualism of ancient Indo-European society.

8.1.6. Indo-European terms for 'half'

The dualistic structure of ancient Indo-European society and the resultant dualistic worldview also find a reflection in both the lexicon and the semantics reconstructed for Proto-Indo-European. The very word for 'half' in Indo-European is etymologically related to the verb 'fold in half' (i.e. 'get two halves out of one whole'):

PIE **ph(o)l-* 'half; pair':³ **t'wei-phlo-* 'double, doubled' (lit. 'two-halved'): Hom. Gk. *di-plóos* 'double', Lat. *duplus* 'double', *duplex* 'consisting of two halves', OIr. *diabul* 'double', Goth. *twei-fls* 'doubt' (with metaphoric transfer: 'vacillate between two possible choices'), OHG *zwīval(i)* 'doubtful' (Ger. *Zweifel*). The Slavic cognate has both the original meaning 'half' (OCS *polŭ*) and 'sex, gender' (male or female), i.e. 'half of society'; the latter may reflect relatively ancient semantic properties of this word, as is shown by Alb. *pálē* 'side, party, section, division, pair, harnessed pair'.

8.1.7. Pairs of lexical antonyms in Indo-European

A number of paired lexical antonyms can be reconstructed for Indo-European: 'good' and 'bad', 'high, top' and 'low, bottom', 'wide' and 'narrow', 'full' and

3. Cf. the etymologically related derivatives in **-tho-* meaning 'fold': Skt. *puṣa-* 'a fold' (from **pulta-*), Mlr. *alt* 'a fold', Goth. *falpan* 'fold', OE *fealdan* 'fold' (Engl. *fold*), OHG *faltan* 'fold' (Ger. *falten*).

'empty', 'large' and 'small', 'thick' and 'thin', 'long' and 'short', 'heavy' and 'light', 'new' and 'old', 'black' and 'white', 'right' and 'left', and others. Such pairs can be interpreted in the various historical traditions as symbolizing the features of two cosmic creative principles. Examples of some such pairs follow.

***wesu- / *su- 'good' : *t'us- 'bad'**

'good': Luw. *wašui-* 'good', *wašu-* (in compounds), Hitt. *aššu-* 'good', *aššu* (noun), Skt. *vásu-* 'good', *su-* 'good', Avest. *vanhu-*, *hu-* 'good', Gk. *eús* 'good', *hu-* 'good' (in compounds); Gmc. *Wisu-* (in compound names), Gaul. *Vesu-* (in compound names), OIr. *feib* (dat.sg.) 'perfection', *fó* 'good', OCS *unje* 'best' (cf. Goth. *iusiza* 'better').

'bad': Skt. *duṣ-* 'bad', Avest. *duš-* 'bad', Gk. *dus-* 'bad' (in compounds); Arm. *t-* 'non-' (in compounds), Lat. **dis-* in *difficilis* 'difficult', Goth. *tuz-*, OE *tor-*, OHG *zur-* 'non-'.

The opposition of 'good' to 'bad' permeates that part of the Indo-European lexicon having to do with mythological conceptions. Examples include Skt. *su-mānas-* 'well disposed' : *dur-manāḥ* 'gloomy, hostile, inimical'; Avest. *hu-manah-* 'in a good mood', *vohu-manah-* 'good mood', Myc. Gk. *e-u-me-ne* (personal name), Hom. *eumenétēs* 'good-thinking', *eumenēs* 'well-disposed' : *dusmenēs* 'evil-intentioned, hostile'; Skt. *su-śrávas-* 'having good fame', Avest. *haosrauuarḡha-* 'good fame' : Avest. *dēuš.srauuah-* 'bad fame'; Hom. Gk. *euklewēs* 'glorious, renowned', *eu-kleíē* 'good fame', etc. (see Schmitt 1967:85ff.); Skt. *su-dyút-* 'good radiance' (epithet of Agni; cf. Hitt. *Aššu-Šiwatt-* 'Good Day') : OCS *dŭždŭ* 'rain' from **dus-dyu-*, lit. 'bad day' (see Trubetzkoy *apud* Watkins 1974:107).

***bherǵh- 'high, top' : *nī- 'low, bottom'**

'high, top': Hitt. *parku-* 'high', Toch. A, B *pärk-* 'rise, ascend', Skt. *bṛhánt-* 'high, raised', Avest. *bərəz-* 'high', Arm. *barjr* 'high' (the Indo-European word also means 'mountain, heights': see II.5.2.4).

'low, bottom': Skt. *ní* 'down', cf. *nīpá-* 'located far below' (of water), Avest. *nitāma-* 'lower', Arm. *ni-* 'down', OHG *nidar* 'down' (Ger. *nieder*), OCS *nizŭ* 'down'; the word is also opposed to **bherǵh-* in the meaning 'mountain, heights': Gk. *neíós* 'field, plain' (from 'lowlands'), OCS *niva* 'field, grainfield'.

***ph(e)l-H-/-th- 'wide, flat' : *Hanǵh-u- 'narrow'**

'wide, flat': Hitt. *palḡ-i-* 'wide', Lat. *plānus* 'flat', Latv. *plāns* 'flat, even'

(derivatives in **-no-*); Hitt. *paltana-* 'shoulder', Skt. *pr̥thú-* 'wide', Avest. *pərəθu-* 'wide', Gk. *platús* 'wide', Arm. *layn* 'wide', OCS *plešte* 'shoulder'.

'narrow': Skt. *am̐hu-* 'narrow-' (in a compound), Gk. *amphén* 'back of head, occiput' (i.e. narrow part of head), Lat. *angi-* 'narrow' (in *angi-portus* 'tight passage'), Goth. *aggwus* 'narrow', OE *enge*, OHG *angi*, *engi* 'narrow' (Ger. *eng*), OCS *qzŭ-kŭ* 'narrow'.

Derivatives of **phelH-* acquire the meaning 'earth' (from 'flat') in a number of dialects: Skt. *pr̥thiví* 'earth; surface of the earth' (cf. Gk. *Plátaia*, city name in Boeotia), Arm. *hoł* 'earth, country', OIr. *láthar* 'place', OCS *polje* 'field'. Skt. *pr̥thiví* 'earth' acquires a mythological sense in the opposition of earth to sky: *dyāvā-pr̥thiví* (in the dual, symbolizing the unity of two opposed principles). In the Vedic hymn RV X, 10, 9, a dialog between Yama and Yami, Yami says to her brother Yama: *divá pr̥thivyā mithunā sábandhū* '(our) pair (*mithunā*) has the same kind of kinship as the sky and the earth'.

***phlH-(no-) 'full' : *wāsthō- 'empty, devastated'**

'full': Skt. *prāṇa-* 'full', *pūrṇā-* 'full', Avest. *pərəna-* 'filled', *frāna-* 'filling', Arm. *li* 'full' (from **phleH-yo-s*, cf. Gk. *pléos* 'full'), Lat. *plēnus* 'full, filled', OIr. *lán* 'full', Goth. *fulls* 'full', OE *full* (Engl. *full*), OHG *fol* (Ger. *voll*), Lith. *pilnas*, OCS *plŭnŭ* 'full'.

'empty': Hitt. *waštul* 'devastation, deficiency; crime, sin' (see Laroche 1973), Lat. *uastus* 'wasted, empty', OIr. *fás* 'empty', *fásach* 'desert, wasteland', OHG *wuosti* 'unworked, empty, wasted' (Ger. *wüst*, *Wüste*), OE *wēste* 'empty'.

***mek̑'H- 'large' : *dhebh- 'small'**

'large': Hitt. *mekki-* 'numerous', Toch. A *māk*, B *māka* 'numerous', Skt. *mahi-* 'large', *mahānt-* 'large', Avest. *mazant-* 'large', Gk. *mégas* 'large', Arm. *mec* 'large', Alb. *madh* 'large', Lat. *magnus* 'large', OIr. *mochtae* 'large', Goth. *mikils* 'large'.

'small': Hitt. *tepu-* 'small', *tepnu-* 'make small, reduce, belittle', Skt. *dabhnóti* 'harms, damages', Avest. *dəbānaotā* (2pl. pres.) 'you deceive'.

***bhengh- 'thick, solid' : *then- 'thin'**

'thick': Skt. *bahú-* 'numerous, solid, dense', Gk. *pakhús* 'thick, dense', Latv. *biezs* 'solid, dense'.

'thin': Skt. *tanú-* 'thin', Gk. *tanú-* 'long', Lat. *tenuis* 'thin', OIr. *танаe* 'thin', OIcel. *punnr* 'thin', OHG *dunni* 'thin' (Ger. *dünn*), OCS *tŭnŭkŭ* 'thin'.

***t'elH(n)gho-** 'long' : ***mreǵhu-** 'short'

'long': Hitt. *daluki-* 'long', *dalugašti-* 'length', Skt. *dīrghá-* 'long', Avest. *darəga-* 'long', OPers. *darga-* 'long', MPers. *drang* 'long', Gk. *dolikhós* 'long', OCS *dlǫgŭ* 'long', Lith. *ilgas* 'long'; Lat. *longus* 'long', Goth. *laggs* 'long', OE, OHG *lang* 'long' (Engl. *long*, Ger. *lang*).

'short': Skt. *múhu* 'suddenly', Avest. *mərəzu-* 'short', Gk. *brakhús* 'short', Lat. *brevis* 'short', Goth. *gamaúrgjan* 'shorten'.

***k'o(e)r-u-** 'heavy' : ***legho-** 'light'

'heavy': Skt. *gurú-* 'heavy', Avest. *gouru-* 'heavy', Lat. *gravis* 'heavy', Mlr. *bair* 'heavy', Goth. *kaúrjōs* 'heavy', Latv. *grūts* 'heavy'.

'light': Skt. *laghú-*, Ved. *raghú-* 'light, deft', Gk. *elakhús* 'small', Lat. *leuis* 'light', Goth. *leihts* 'light', OHG *liht(i)* 'light' (Ger. *leicht*), OE *leoht* (Engl. *light*), OCS *līgŭkŭ* 'light'.

***newo-** 'new' : ***wetho-** 'old'

'new': Hitt. *newa-* 'new', *newaḫḫ-* 'renew', Toch. A *ñu*, B *ñuwe* 'new', Skt. *náva-* 'new', Avest. *nava*, Gk. *né(w)os*, Lat. *nouus*, Lith. *naūjas*, OCS *novŭ* 'new'.

'old': Hitt. *wett-* 'year', Skt. *vatsá-* 'year', Sogd. *wṭcnyy* 'old', Gk. *wétos* 'year', Lat. *uetus* 'old', OCS *vetŭxŭ* 'old'.⁴

***albho-** 'white, light-colored' : ***mel-** 'black, dark'⁵

'white': Hitt. *alpa-* 'cloud', Gk. *alphós* 'white spot on skin; walleye' (cf. *alpoús* · *leukoús* 'white' (gen.pl.), Hesychius), Lat. *albus* 'white', Umbr. *alfu* 'white' ('*alba*', fem.), OHG *albiz* 'swan', OCS *lebedŭ* 'swan' (named for its white color); cf. the dialectal word for 'tin', Lith. *álvas* 'tin', OPruss. *alwis* 'lead', Russ. *olovo* 'tin', i.e. 'white or shiny metal' (Toporov 1975:I.81).

'black': Skt. *maliná-* 'dirty, black', *mlāna-* 'black, dark', *māla-* 'dirt, sin', Gk. *mélās* 'black', Lat. *mulleus* 'red, crimson, purple' (the color worn by consuls, praetors, and curule aediles), Goth. *mēla* 'written mark', *mēljan* 'write', OHG

4. Another ancient word for 'old' is ***sen-**: Skt. *sána-*, Avest. *hana-*, Arm. *hin* 'old', Gk. *hénos* 'old, last year's', *di-enos* 'of the year before last' (i.e. 'of two-year time removal'), Lat. *senex*, gen. *senis* 'old' (cf. Skt. *sanaká-*), OIr. *sen* 'old', Goth. *sinista* 'oldest', Lith. *sėnas* 'old'.

5. Cf. also PIE ***śoer-** 'dark color': Pers. *xvāl* (from **swer-d-* 'soot'), Sogd. *xwrn-* 'color', Oss. (Digor) *xoārun* 'color, paint' (verb), *xoāraen* 'color', cf. OIran. **hvāra-* in the place name Khwarezm, lit. 'black-earth land', and also Lat. *sordēs* 'dirt'; Goth. *swarts*, OIcel. *sorta* 'black color', OE *swear*, OHG *swarz* (Ger. *schwarz*) 'black', OIr. *sorb* 'dirt' (Bailey 1976).

ana-malī 'spot', Latv. *mēlns* 'black', OPruss. *melne* 'dark-blue spot', Lith. *mėlas* 'dark blue', cf. Russ. *malina* 'raspberry'.

**t'eḱh-s-* 'right' : *'left'

'right': Skt. *dākṣiṇa-* 'right', Avest. *dašina-* 'right', Lith. *dėšinas* 'right', OCS *desnŭ* 'right', Gk. *deksiterós* 'right', Lat. *dexter*, OIr. *dess* 'right', Goth. *taíhswa* 'right'.⁶

'left': Gk. *laiós* 'left', Lat. *laeuus* 'left', OCS *lěvŭ* 'left'; Gk. *skaiós* 'left', Lat. *scaeuus* 'left'; Skt. *savyá-* 'left', Avest. *haoya-* 'left', OCS *šujī* 'left', Toch. A *śālyās* 'on the left', B *śwālyai* 'on the left' (cf. Luw. *ipala-* 'left', Hitt. *GÜB-la-* 'left': Čop 1971:3-5, 23).⁷

8.1.8. The symbolism of right and left in Indo-European

The unanimous agreement among the Indo-European dialects as regards PIE **t'eḱh-s-* 'right' is in striking contrast with the impossibility of reconstructing a protoform for 'left'. The semantic element 'left' is expressed by shared forms only in individual dialect groupings (Greek-Italic-Slavic, Indo-Iranian-Celtic?-Slavic, Tocharian-Anatolian). The reason for this disparity must lie in the symbolic meaning of 'left' in Indo-European and its tabooing and partial replacement in individual dialects and dialect groupings. The taboo is due to the symbolic association of the right-left opposition with the oppositions of favorable and unfavorable, just and unjust, good and bad.

The significance of the left-right semiotic opposition in the Indo-European symbolic system is confirmed by coinciding facts from separate Indo-European traditions (see also Kraig 1978:163). The relevant associations can be found in the earliest Indo-European traditions, beginning with Old Hittite. For the Hittites the concept of 'left', expressed by the Sumerogram *GÜB-la-*, is associated with unfavorable outcomes of divination, false testimony, and lost lawsuits (see Werner 1967:78), with bad and negative things (Kammenhuber 1965:191): e.g. *m[a]n-kan ŠA É.ŠÀ ŠA LUGAL GÜB-an uttar kuitki auf[tt]jen* 'if you see any bad (lit. 'left') thing concerning the royal chambers' (KUB XXI 42 IV 3ff.); for Hittite left-right symbolism see also Riemschneider 1958.

6. Hittite and Tocharian replace the original word with Hitt. *kunna-* 'right' (in opposition to *GÜB-la-* 'left') and Toch. A *pāci* 'right'.

7. The phonetic complement *-la-* to the Sumerogram in Hitt. *GÜB-la-* makes it possible to discern in this word the Hittite cognate to Luw. *ipala-* 'left'. In that case we can posit **g/kipala-* for Hittite (cf. Hitt. *keššar-* beside Luw. *iššari-* 'hand', Hitt. *gimmara-* beside Luw. *immari-* 'field, steppe': see Van Windekens 1981). The resultant Hittite-Luwian *(*k*)*ip-ala-*, taken together with Toch. B *śwāl*, permits reconstruction of a protoform **ghibhōlo-*, which, with *-*ol-* segmented off as a suffix, calls to mind Sum. *GÜB* 'left' — an Indo-European borrowing from Sumerian?

In ancient India, mythological phratries were opposed to each other as left to right: the Kauravas were regarded as 'left', 'lower', 'lunar' and hence as having negative symbolic value, while the Pandavas were 'right', 'upper', 'solar', hence positive (Bosch 1960). The same opposition of left to right is associated with the opposition of male to female in Indic tradition (see Hocart 1950).

In ancient Greek tradition, left and right are connected with female and male creative principles; for the Pythagoreans they were basic philosophical categories with which the world was described (see G. Lloyd 1962, 1966).⁸

This association of right with the favorable, good, and positive, and left with the unfavorable, bad, and negative, can be regarded as a semantic universal of language. It is of course based on the typical differential physiological capacity of the human right and left hands. The right hand is perceived as the more active and functionally more basic, hence naturally associated with the positive and favorable in contrast to the more passive left hand, which with its lesser dexterity is associated with the unfavorable and the less valued in the mind of early man.

The view of right as basic and fundamental also finds concrete expression in the individual ancient Indo-European cultures, in conceptions which reveal traces of the Proto-Indo-European understanding of the two hands (PIE **ǵhes-ǵ-/ *ǵhes-tho-* 'hand': Hitt. *keššar* 'hand', Luw. *iššari-* 'hand' (cf. *išarwili-* 'right'), Lyc. *izre*, Toch. A *tsar* 'hand', B *šar*, Hom. Gk. *kheír* 'hand', Arm. *jern*; Skt. *hāsta-*, Avest. *zasta-*, OPers. *dasta-*, cf. Lat. *praestō* 'under the arm' < **prai-hestōd*,⁹ Lith. *pa-žastis* 'underarm'). In Homer the right hand is described as the aggressive one which wields the spear, while the left hand is the defensive one which holds the shield (Cuillandre 1944).¹⁰ For the Hittites the right hand and the right side were seen as more significant and more esteemed than the left. As a sign of special respect, the king Anittas promises the leader

8. Subsequently, a number of Indo-European dialects underwent a reverse semantic shift of 'just, proper, correct' to 'right, right side': cf. the meanings of the Germanic forms OHG *reht* 'straight, correct' (Ger. *recht*), OE *riht* (Engl. *right*) 'true, correct, straight' (cognate to Lat. *rēctus* 'straight'), and others, which acquire the new meaning 'right' (as opposed to 'left'). Likewise in Slavic: OCS *pravŭ* 'straight, correct', figuratively also 'right' (as opposed to 'left').

9. In Italic the usual word for 'hand' has a different root: Lat. *manus*, gen. *manūs* 'hand', Umbr. *manuv-e*, Osc. acc. *manim* beside Gk. *márē*, Olcel. *mund* 'hand' (Pokorny 1959:740-41); see below for more detail. For 'arm, shoulder (blade)' in Indo-European a base **arH-mo-/ *rH-mo-* can be reconstructed: Skt. *īrmá-* 'arm', Avest. *arəma-* 'forearm', Arm. *armukn* 'elbow', Lat. *armus* 'arm, forearm; shoulder blade', Goth. *arms*, OHG *arm*, OE *earn*, OPruss. *irmo* 'arm', OCS *ramo* 'shoulder'.

Another ancient term, **bāǵhu-*, meant 'elbow' or 'forearm': Toch. A *poke*, B *pokai* 'upper arm', Skt. *bāhú-* 'forearm', 'front paws (of animal)', Avest. *bāzāuš* 'forearm', Gk. *pēkhus* 'elbow, forearm', Olcel. *bógr* 'arm, shoulder', OE *bōg* 'arm, shoulder', OHG *buog* 'shoulder; thigh', 'shoulder blade' (of animal) (Ger. *Bug*): Benveniste 1959 [1965:71-82].

10. Cf. the custom of many peoples, including the Scythians (according to Herodotus, IV.62) and the ancient Ossetes (Dumézil 1976:44-45), of cutting off the right hand of a defeated and slain enemy, as though to symbolize the fact that he had been rendered completely harmless.

Burushanda to seat him at his right: *a-pa-a-ša pé-e-ra-am-mi-it ku-un-na-az e-ša-ri* 'and he will be seated before me to the right' (KBo III 22+Rs.78-79).

8.1.9. Terms for the paired body parts in Indo-European

The opposition of the right hand as active to the left as passive, which had a natural physiological basis, could be extended to other paired body parts such as eyes,¹¹ feet,¹² knees,¹³ and ears,¹⁴ which are also evaluated as positive or male vs. negative or female. In Sanskrit tradition as recorded in the Upanishads (*Bṛhadāraṇyaka Upaniṣad* IV, 2.2-3, *Maitrāyaṇīya Upaniṣad* V, 11), in an image of a human being the god Indra appears in the right eye and his goddess wife in the left eye. In Slavic tradition, numerous East and South Slavic superstitions associate the left eye with misfortune and grief, the right eye with good fortune; and correspondingly in various rites, including wedding rites, the right foot is shod before the left, and so on (see Ivanov and Toporov 1974:268).

8.2. The transformation of ancient Indo-European social organization into a structure with three or four classes. Reflexes of this structure in intellectual constructs and mythology

8.2.1. The transformation of the ancient dual social organization

The binarism of marriage and affinal kinship among the ancient Indo-Europeans, which resulted in the overall binarism of the earliest Indo-European

11. PIE **se/okʰo-*: Hitt. *šakuwa* 'eyes', OIr. *rosc* 'eye; gaze, glance', Goth. *salþvan* 'see'; Toch. A *ak*, B *ek*, Skt. *ákṣi* 'eye', Gk. *ósse* (du.) 'eyes', Arm. *akn* 'eye', Lat. *oculus* 'eye', Goth. *augō*, OIcel. *auga*, OHG *ouga* (Ger. *Auge*), OE *eage* (Engl. *eye*), Lith. *akis* 'eye', OCS *oko* 'eye'. Note also **bʰruH-* 'eyebrow(s)': Toch. A *pärwān-*, B *pärwāne* 'eyebrows' (dual), Skt. *bhrū-* 'eyebrow', Avest. *brvat-* 'eyebrows' (dual), Gk. *ophrūs* 'eyebrows', Mlr. *brúad* 'eyebrows' (gen. du.), OE *brū* (Engl. *brow*), Lith. *bruvis* 'eyebrow', OCS *brŭvŭ*.

12. PIE **pʰet-*: Hitt. *para-* 'foot', Toch. A *pe*, B *paiyye*, Skt. *pad-* 'foot', Avest. *pad-* 'foot', Arm. *otn* 'foot', Gk. *poús*, gen. *podós*, Lat. *pēs*, gen. *pedis*, Goth. *fōtus*, OIcel. *fótr*, OE *fōt* (Engl. *foot*), OHG *fuoꝛ* (Ger. *Fuss*).

13. PIE **kʰenu-* 'knee': Hitt. *gi-e-nu* 'knee', *gi-e-nu-uš-* 'knee joint' (Eichner 1979), Toch. A *kanwem*, B *kenine* (du.), Skt. *jānu*, Avest. *žnūm*, Arm. *cunr*, Hom. Gk. *gónu*, Lat. *genū*, gen. *genūs*, Goth. *kniu*, OHG *kneo* (Ger. *Knie*), OE *cnēo* (Engl. *knee*).

14. PIE **o(H)us-*: Avest. *uši* (du.) 'ears; reason, mind', Arm. *unkn* 'ear', Gk. (Dor.) *ōs* 'ear', pl. *ōwata* 'ears', Alb. *vesh* 'ear', Lat. *auris* 'ear', OIr. *áu*, *ó* 'ear', Goth. *ausō*, OHG *ōra* (Ger. *Ohr*), OE *ēare* (Engl. *ear*), Lith. *ausis*, OCS *uxo*, gen. *ušese*. Formally related to this word is the etymologically unclear Hittite verb *auš-* 'see': 1sg. *uḫḫi*, 2sg. *autti*, 3sg. *aušzi*, 1pl. *aumeni*, *umeni*, 2pl. *autteni*, *aušteni*, *ušteni*, 3pl. *uwanzi*, 1sg. pret. *uḫḫun*, 2sg. *aušta*, 3sg. *aušta*. For the semantic shift from 'ear' to 'see' cf. Kartvelian: Geo. *q'ur-i* 'ear' beside *q'ur-eba* 'look'.

social structure, gradually began to change due to increased complexity of social structure and the formation of several functionally distinct social groups.

While at the earliest stages of social development groups of people were defined not by their economic activity but by their membership in one or another moiety, clan, or family, at later stages of development occupationally defined groups of people began to acquire an identity and a social standing based on their social function and not on their family or clan membership. Particular social groups arose, comprised of people sharing a given economic or social activity.

8.2.2. *The rise of three or four social classes in the individual historical Indo-European societies*

By a relatively late period of Indo-European social development, apparently around the time of the breakup, we can distinguish at least three discrete groups which are reflected in ancient Indo-European societies as three or four social classes, each with its own distinct social functions.

In Old Hittite society, the free people comprised the social groups of priests (Hitt. *šankunni-*, cf. Akkad. *šangū*, Sum. LÚSANGA), warriors (ERÍNMEŠ ANŠE.KUR.RAMEŠ 'foot soldiers and chariot soldiers', cf. *tuzzi-* 'army'), and farmers, who fell into groups according to their degree of dependency on landowners (LÚMEŠ GIŠTUKUL 'tool person, artisan', their subordinates LÚMEŠ APIN.LAL 'plowmen' and LÚMEŠ SIPĀ 'herders', as well as artisans of various types, e.g. LÚMEŠ UŠ.BAR 'weavers', LÚMEŠ NAGAR 'carpenters', LÚMEŠ AŠGAB 'curriers, tanners', and others: see Giorgadze 1973:19ff.).¹⁵

In ancient India there were three basic social classes (*várṇa-*): the priests or brahmans (*brāhmaṇā-*), the warriors or kshatriyas (*kṣatriya-*),¹⁶ and the farmers (*váiśya-*),¹⁷ in addition to artisans, associated with a fourth *varna*, the shudras (*śūdrá-*).¹⁸ A similar system is reflected in the Avestan texts, which distinguish priests (*āθravan-*, in the Gathas *zaotar-*), warriors (*raθaēštā-*, in the Gathas

15. The term LÚMEŠ GIŠTUKUL designates a social class ranked between the warriors and the dependent farmers and artisans. They were people who had received land allotments and who were obliged to render military service in case of need (Diakonoff 1967).

16. A term of Indo-European origin, etymologically related to Gk. *ktáomai* '(I) obtain', *ktēma* 'acquisition, allotment', Myc. Gk. *ki-ti-me-na ko-to-na* = *kimēna ktoi-na* 'land allotment'; *kṣatrām*, which *kṣatriya-* is related to, must originally have meant an allotment received by a warrior: see Palmer 1955:17.

17. The term is related to Skt. *vīś-* 'village, settlement' (Gk. *woikos* 'house, household', Lat. *uīcus* 'village', OCS *vīśl* 'village', etc.: see II.7.2.2 above) and originally was a collective term denoting the people of one village: see Palmer 1955:17.

18. The term *várṇa-*, lit. 'color', is based on a system of color symbolism where each *varna* had its own specific color: the brahmans were associated with white, the kshatriyas with red, the vaishyas with yellow, and the shudras with blue.

nar-), farmers and herders (*vāstryō fšuyant-*, in the Gathas *vāstar-*),¹⁹ and artisans, who belonged to a fourth class (*hūiti-*): see Benveniste 1932a, 1969:I.279ff.²⁰

An analogous social system can be assumed for early ancient Greek society, as shown by the relations between separate social groups reflected in Greek myths: priests (*hierēis*, *hieropoiōi*), warriors (*mákhimoi*, cf. *phúlakes* 'watchmen, doorkeepers' in the myth transmitted by Strabo), farmers (*geōrgoi*), and artisans (*dēmiourgoi*): Benveniste 1969:I.289, q.v. for possible tripartite social structure in the Umbrian Iguvine tables (cf. Palmer 1955:16).

8.2.3. *The chronology of the rise of the three social classes in the individual historical societies; the problem of tripartite structure in Indo-European society and mythology*

Similar though the social segmentations were in the ancient Indo-European societies just surveyed, the terms for the social classes are not cognate.²¹

19. All these Iranian terms have Indo-European etymologies and can be regarded as specifically Iranian words for these social groups: Avest. *āθravan-* 'priest' corresponds to Skt. *ātharvā* 'sorcerer priest' (possibly cognate to Avest. *ātar-* 'fire', Serbo-Cr. *vātra* 'fire', Ir. *āiθ* 'oven'); Avest. *raθaēštā-* goes back to a word for 'charioteer', cf. Skt. *rathe-ṣṭhā-* 'one who stands in a chariot'; Avest. *vāstar-* is cognate to Hitt. *weštara-* 'shepherd'.

20. Analogously to the Indian *varnas*, the Iranian social classes were also associated with particular colors (*pištra-*, lit. 'color', later 'craft, trade': Benveniste 1969:I.279): the priests with white, the warriors with red, the farmers with blue. The analogous Celtic social classes are associated with the same colors: the druid priests were symbolized by white, the warriors by red: Dumézil 1954:45. It is significant that in all three of these traditions the first two classes — the priests and warriors — are characterized by the same colors, white and red respectively, while the color of the third class, the farmers and craftsmen, varies. The identical colors for identical classes in Indo-Aryan and Celtic show that the color symbolism is of Proto-Indo-European age. According to Palmer (1974:11, 17-18), the class that owned land allotments was called **arya-* (from **ar-* 'receive, acquire, own') in Proto-Indo-Iranian times; only subsequently did the term **arya-* come to be an ethnonym. For this interpretation of **arya-* cf. Hitt. *arnuvala-* 'people taken captive and then given land allotments' from the same Indo-European root **e/or-*.

21. This does not fully apply to the Hittite terms, since they are either hidden by Sumerograms or relatively late foreign borrowings, e.g. Hitt. *ṣankunni-* 'priest'. Skt. *brahmán-* 'priest' is usually compared to Lat. *flāmen* 'priest' as a term applied to the highest priestly rank (from PIE **b^hlāgh-men-*: see Pokorny 1959:154, Dumézil 1966:90-91); but there are phonetic difficulties with these forms (the absence of a reflex of **g^h-* in the Latin word) and semantic inconsistencies with the other cognates of Skt. *brahmán-* (e.g. OPers. *brazman-* 'form, appearance': see Benveniste 1969:I.282-85, Toporov 1974. These Indo-Iranian words can be compared to Hom. Gk. *morphē* 'form' (from **morb^h-ā-*: Thieme 1968d:203). In Latin, 'priest' is the compound *pontifex*, etymologically 'road builder', cf. Skt. *adhvaryū-* 'priest' beside *adhvará-* 'road', Dumézil 1966:553-54. In Celtic, the word for 'priest, druid' is formed on the ancient Indo-European word for 'tree': OIr. *drúī* 'druid', Gaul. *Druides*, pl. *Druidae*. The lack of a generic Proto-Indo-European term for the class of priests can be explained as due to tabooing of the original word and replacement by descriptive expressions in the individual historical traditions.

Therefore, even if we posit the division into social classes for the late Proto-Indo-European period, there is no possibility of reconstructing the terms that referred to them.

8.2.4. *The reorganization of the ancient marriage and affinal relations and the rise of endogamy in the individual historical societies*

The formation of social classes with different functions led to a radical restructuring of the original marriage and affinal relations, which had been based on the principle of dual exogamy. The appearance of new social groupings gradually destroyed the old principles governing marriage and affinal kinship and led to the establishment of new relations within each of the new social groups. This is in essence a shift from exogamy between moieties to endogamy within the newly-formed social groups. The examples surveyed above where the old marriage rules were violated in Old Hittite society obviously reflect a shift to new marriage and kinship relations due to the reorganization of society and the formation of separate social groups.

Also revealing in this regard are the instructions found in Hittite texts whose effect is to limit marriage exchange, ultimately resulting in endogamy within social groups. A Middle Hittite text concerning the 'Stone House' reads: A.NA LÚMEŠ É.NA₄-ya-kán AŠ.ŠUM É.GI₄.ATIM an-da-an pí-eš-kán-du pa-ra-a-ma-kán DUMU.NITA DUMU.SAL AŠ.ŠUM É.GI₄.ATIM LÚan-da-i-ya-an-da-an-ni-ya li-e ku-iš-ki pa-a-i 'a bride may be given into the house of the people of the Stone House, but let no one give a son (or) daughter out of the house as bride or son-in-law' (KUB XIII 8 Vs. 13-15).

In India, as the symbolic *varna* groups turned into actual closed social classes, the practice of endogamous marriage increased, especially in the upper castes, as did hypergamy, where a higher caste could give wives to a lower caste but not vice versa (L. Dumont 1966:153ff., Hocart 1950).

Under these conditions, the rise of endogamous marriage within large social groups led to the formation of new kinship relations among members of a given social group. If the group was small, then endogamy would obviously lead to marriage between close consanguineal relatives. Precisely such incestuous marriages were the result of endogamy within small groups such as a reigning dynasty, where even marriage between brother and sister might be permitted. This is the extreme result of endogamy, with examples to be found in many traditions, including ancient Indo-European ones — among the Hittites, the Greeks, and the ancient Iranians, as well as in ancient Armenia and elsewhere (see Dovgjaló 1968:141, Bin-Nun 1975:141).

8.3. The structure of the ancient Indo-European pantheon

8.3.1. *The correlation between social structures and the structure of the pantheon*

The reconstructed dual social structure of Indo-European, conditioned by the binary nature of marriage and affinal relations, and the increasing complexity of the society as discrete social groups formed, presuppose analogous structures in the religious conceptions of the ancient Indo-Europeans, where earthly social relations would have been reflected in a mythically transformed shape. Religious conceptions and the relations among the elements of a pantheon are ultimately projections from real social relations. The pantheon of a tradition and the mythological system created in accord with it are a sort of reflection or model of the social relations that characterize the society at the relevant stage of its development.

This is how we must understand the tripartite society established for Indo-European by Dumézil and the three functions characteristic of Indo-European mythology. The three or more elements reconstructed for the Indo-European pantheon must reflect three types of social function and three corresponding forms of activity in ancient Indo-European society (see Dumézil 1958, 1966, 1968, 1971, 1973, 1976; also Littleton 1973, Haudry 1981:20ff.).

8.3.2. *The binary nature of the ancient Indo-European pantheon*

For the Proto-Indo-European pantheon we can reconstruct with certainty at least two main deities, which yield regular reflexes on both the expression and content planes in the individual ancient Indo-European dialects.

8.3.3. *The highest Indo-European deity, the sky god*

PIE ***t'yeu(s)-ph₂ter-** 'father god': Skt. *Dyáuṣ pitā* 'father god' (epithet of the supreme deity), 'Sky god', Gk. *Zeû páter* (voc.), Lat. *Iūpiter*, Luw. *taiš Tiwaz* 'father god', cf. ORuss. *Stribog*".

The first component of this compound, ***t'yeu-**, can be reconstructed as a general term for 'god' and specifically for the sun god or sky god: Hitt. *šiuš*, acc. *šiun*, gen. *šiunaš* 'god, sun god, sky god' (see Neu 1974:116-31, Watkins 1974); Luw. *ḪTiwaz* 'Sungod', Skt. *dyáuḥ* 'sky', Gk. *Zeús* 'sky god', gen. *Diwós*, dat. *Diwí*, Myc. *di-we*, OLat. *Diouis*, gen. *Iouis* 'Jupiter', Osc. *Diúveí* 'Iovi'. As an ***o-**stem in normal grade, ***t'eiwo-**: Skt. *devá-* 'god', Avest.

daēva- ‘demon’, Lat. *deus* ‘god’, *dīuus* ‘divine’, OIr. *dia*, gen. *dé* ‘god’, OÍcel. *tívar* ‘gods’, OPruss. *deiws*, Lith. *diēvas* ‘god’.

The word for ‘god’ is etymologically connected with the root **t’ei-* ‘shine’: Skt. *dīdeti* ‘shines, is radiant’, Hom. Gk. *déato* ‘it seemed’. Derivatives of the same root yield a word meaning ‘day’: Hitt. *šiwatt-* ‘day’, Lat. *diēs* ‘day’, OIr. *die* ‘day’; Skt. *dīvā* ‘during the day, in daytime’, cf. *naktām-divam* ‘by night and by day’, Arm. *tiw* ‘day’, Gk. *éndios* ‘in broad daylight’, Lat. *dīus* ‘by day’ (PIE **t’iu-*).²²

That the sky god **t’yeu-*, also known as **t’yeu(s)-phHther-*, occupied the dominant position in the Indo-European pantheon can be inferred from the fact that in the individual Indo-European mythic traditions the deities which continue the ancient sky god rank supreme in their respective pantheons. In Anatolian the god **Tiu-* (Hitt. *Šiu-*, Luw. *Tiwa-*, Palaic *Tiya-*) occupies the central position among the numerous deities of the pantheon. In the Old Hittite Anittas text the god *Šiu-* is the main god of the tribe, called ‘our Sun God’ (*Šiušummiš*); a temple is erected to him and the king Anittas returns a statue of him to Nesa.

In early Sanskrit tradition as recorded in the Rigveda, *Dyáuṣ pitá* ‘father sky-god’ is the progenitor of all the heavenly gods, which shows his dominant position in the ancient Indo-Iranian pantheon. In Greek mythology Zeus, the god of the clear sky who is also addressed as ‘father god’ (*Zeû páter*), dominates all the other gods of the pantheon. Jupiter holds an analogous position in the Italic pantheon and is the equivalent of Zeus in the Italic mythological tradition.

The original functional identity of these deities in ancient Indo-European mythic traditions, together with their cognate names, allows us to posit a supreme god **t’yeu(s)-phHther-* as the main deity of the Proto-Indo-European pantheon. The dominant role of the ‘father god’ **t’yeu(s)-phHther-* reflects the dominant role of the father, **phHther-*, in the patriarchal Indo-European family where the children are subordinated to the father (see 8.1.3 above for the daughter and twin sons of the supreme god).

Given the reconstruction of social classes, including a distinct class of priests, for the late Proto-Indo-European period, we can associate the main Proto-Indo-European deity **t’yeu(s)-phHther-* with the class of priests and regard the deity as the functional equivalent in the mythological system of the priestly caste in the social world.

22. The antonym of ‘day’ in Indo-European is **ne/okh^{ho}th-* ‘night’ (with loss of labialization of **kh^{ho}* in a number of dialects): Hitt. *nekut-* ‘evening’, Toch. B *nekcīye* ‘in the evening’, Skt. *nák* ‘night’, *náktam* ‘at night’, Gk. *núks*, gen. *nuktós* ‘night’, Alb. *nátë* ‘night’, Lat. *nox*, gen. *noctis*, OIr. *in-nocht* ‘tonight’, Goth. *nahts*, OHG *naht* (Ger. *Nacht*), OE *neah*, *niht* (Engl. *night*), Lith. *naktis*, Latv. *nakts*, OPruss. *naktin* ‘night’, OCS *noštī* ‘night’. All these words can be brought together formally (pace Peeters 1974a) if we admit delabialization in a number of dialects (excluding Hittite and Greek, where the labialization is transferred to another segment: see 1.2.2.2 above).

8.3.4. *The Indo-European god of thunder and military brigades*

In addition to the ranking deity ***t'yeu(s)-phHther-**, we can also reconstruct a thunder god who was also the god of groups of warriors and protector of military campaigns. He is associated with high cliffs reaching to the sky, from which he sends down thunder and lightning:

PIE ***pher(kho)u-no-**: Hitt. *ḪPirwa-* 'the god Pirwa; god on horseback', cf. *ḫekur Pirwa-* 'Pirwa mountain' (see II.4.1.1.5 above) beside Hitt. *peruna-* 'cliff'; Skt. *Parjanya-* 'thunder god, rain god', cf. Skt. *parjanya-* 'rain cloud' and Skt. *Pārvata-* 'mountain god' (cf. the compound *Indrāpārvata-* 'Indra and Parvata') beside Skt. *pārvata-* 'mountain; mountain clouds' (see II.5.2.1 above), Lith. *Perkūnas* 'thunder god', Latv. *Pērķūns* 'thunder god', ORuss. *Perun* 'Perun, god of the prince's military entourage', cf. OIcel. *Fjörgyn* 'mother of the thunder god Thor' beside Goth. *faīrguni* 'cliff' (from a feminine in **-ī*). In the Greek and Roman pantheons the Indo-European god of war is represented under another name, Greek Ares and Latin Mars.

***pher(kho)u-no-**, the Indo-European god of war and military campaigns, is functionally correlated with the Indo-European social class of warriors.

8.3.5. *The relation between the two major gods of the Indo-European pantheon*

The two highest Indo-European gods, ***t'yeu(s)-phHther-** and ***pher(kho)u-no-**, who symbolize the sun and thunder respectively, are opposed to each other as personifications of the major natural forces causing sunny and rainy weather (***su-t'yeu-** 'good day' and ***t'us-t'yeu-** 'bad day'). Thus in addition to social functions they also embody economic functions connected with the natural forces responsible for abundance and the fertility of the earth.

These latter functions may subsequently have been personified by a separate deity, one who evidently arose at a relatively late stage of Indo-European social development and was functionally associated with the social class or classes of farmers and artisans. The relatively recent origin of the Indo-European protector of economic activities is shown by the fact that the names given to this god in the ancient Indo-European traditions are not etymologically related and thus cannot be traced back to a single Indo-European protoform.²³ Therefore any reconstruction of such a god in the Indo-European pantheon must be highly tentative and can go back only to the time of the breakup. At that time the rise of new deities protecting economic activities led to the transfer of these functions from the two major gods to the new ones with their specialized economic functions.

23. They include the Hittite fertility god Telepinus, the Ashvins or Nasatya of Sanskrit tradition, the Roman Quirinus, protector of economic activity, Old Icelandic Freyr, and others: see Dumézil 1958, 1966.

Thus the most plausible reconstruction of the Indo-European pantheon postulates only two major deities:

1. ***t'yeu(s)-phHther-**, with the following functions:
 - (a) supreme deity
 - (b) deity of sun and clear sky
 - (c) deity associated with priestly function
 - (d) protector of fertility
2. ***pher(kho)u-no-**, with the following functions:
 - (a) non-supreme deity
 - (b) god of thunder and lightning associated with high cliffs
 - (c) war god, associated with warrior class
 - (d) protector of economic activity and fertility

In the individual daughter traditions, while the names and the basic functions of the two deities are preserved, there is some transfer of their functions to new elements of the pantheon. This leads to major transformations in the pantheons of the individual historical traditions, in comparison to the original Proto-Indo-European pantheon.

8.3.6. *The transformation of the ancient Indo-European pantheon in the Anatolian tradition*

In the Anatolian pantheon, which by Late Hittite times already distinguished some thousand gods, the functions of the main deity were originally fulfilled by the ancient Indo-European sun god, Anatolian ***Tiu-** (Hitt. *Šiu-*, Luw. *Tiwaz*); next to him in the pantheon was the thunder god **DIM-unna-** (DU, **DİŠKUR**),²⁴ Luw. **DTarhunza** (etymologized as derived from ***tarh-**, cf. Hitt. *tarh-* 'defeat': Laroche 1959a:127). The Luwian name for this god indicates that the thunder god also had military functions, which may reflect a feature of the Proto-Indo-European pantheon. Also significant is the fact that in Hittite military oaths (unlike other oaths: see Oettinger 1976:41, 48) the thunder god **DİŠKUR-aš** figures as an active punisher of anyone breaking the oath: *ki-e li-in-ga-uš šar-ri-iz-zi nu-uš-ši DİŠKUR-aš GIŠAPIN ar-ḫa du-wa-ar-na-a-ú* 'whoever breaks oaths, may the Thunder god completely break his plow' (KUB XL 13+Rs. III 39-40).

The Old Hittite horseback god **Pirwa-**, etymologically connected to the Proto-Indo-European thunder god ***pher(kho)u-no-**, loses the function of thunder-hurler in the Hittite pantheon, is displaced to the periphery, and gradually disap-

24. E.g. in the Anittas text: *ne-pī-iš-za-aš-ta DİŠKUR-un-ni a-aš-šu-uš e-eš-ta* 'to the thunder god of the sky he was kind' (KBo III 22 Vs. 2).

pears. In the most archaic Old Hittite texts he still preserves one of the ancient functions of the Indo-European ***pher(kho)u-no-**, that of protecting economic activity (function 2d above): cf. LUGAL-i *DPí-ir-wa-aš ḫa-ap-pí-na-aḫ-zi* ‘Pirwa brings wealth to the king’ (Laroche 1965a:114, lines 8-9).

Another fertility god in the Hittite pantheon is Telepinus, who symbolizes the disappearing and returning god of fertility (Otten 1942) whose cult is characteristic of a wide area of Mediterranean culture. In the Hittite and Luwian pantheons Telepinus, like a number of other Hittite deities, originates in the analogous Hattic god Talipuna.

The Anatolian god of thunder and war *Tarḫunt-* may have gradually assumed the functions of thunderer and military protector which earlier belonged to ***pher(kho)u-no-** (functions 2b and 2c above), while the Old Hittite Pirwa preserved function 2d, that of protecting economic activity and fertility.

8.3.7. *The transformation of the ancient Indo-European pantheon in Sanskrit tradition*

In Sanskrit tradition as reflected in the Rigveda, the redistribution of the functions of the two main Indo-European deities and the appearance of new gods leads to the rise of new correlations and the fundamental restructuring of the entire pantheon. While *Dyáuṣ pitā* retains the function of progenitor (*pitā*) of all the heavenly gods, he is no longer the supreme deity of the pantheon. This function is taken over by the Adityas (Skt. *Ādityá-*), in particular Mitra and Varuna (Skt. *Mitrā-Váruṇa-*): Dumézil 1948. These two gods, who usually appear together in the Rigveda, are associated with the sun (*Sūrya-*), which is called the ‘eye’ of Mitra-Varuna. They form a binary opposition along several feature distinctions: Mitra is the clear sun, Varuna the night sun (i.e. the moon); Mitra is the good creative principle and covenant, Varuna the dark principle; Mitra is the fire of the sun, while Varuna represents the element of water and the cosmic ocean.

The second Indo-European deity’s functions of thunderer and war god are taken over in the Sanskrit pantheon by the strictly Indic deity Indra (Skt. *Índra-*); the Indo-European ***pher(kho)u-no-** is thereby displaced to a peripheral status, where he is represented by Parjanya (Skt. *Parjanya-* ‘rain god, god of rainclouds’) and Parvata (Skt. *Párvata-* ‘mountain god’). The attributes of these gods in the Sanskrit pantheon preserve a distant connection with their Indo-European prototype ***pher(kho)u-no-**.

In Sanskrit myth Indra is a rival of the sun and the children of the sky god. He steals the wheel of the sun (*cakráṃ sūryam* ‘sun wheel’, RV IV, 30, 4 et pass.); he attacks the daughter of the sky (*duhitāraṃ diváh*) *Uṣās-*, who considers herself great (*mahīyāmānām*, RV IV, 30, 9), and destroys her chariot in order

to humble her. In these encounters of Indra with other gods we can see the process of his gradual rise and transformation into the major deity of the Rigveda pantheon.

The protectors of economic activity, herding and farming, in the Sanskrit pantheon are the Ashvins (*Áśvínau*), the twin sons of the supreme deity *Dyáuṣ pitā́*. Their chariot (*rátha-*), harnessed with horses (*áśva-*), brings good fortune to 'two-legged and four-legged' (*dvipáde cátuṣpade*, RV I, 157, 3). The function of protecting fertility, which belonged to the supreme deity *t'yeu(s)-ph₂ther- in the Indo-European pantheon, is transferred to his sons the Ashvins, who are the major expressions of that function in the Sanskrit pantheon.

Examination of the Sanskrit pantheon in historical perspective, a perspective partly reflected in the Vedic hymns themselves, permits us to reconstruct a transfer of the basic functions of the supreme Indo-European deity to other, newly arisen deities; Skt. *Dyáuṣ pitā́* retains only the symbolic meaning of heavenly progenitor of the other gods of the Sanskrit pantheon.

8.3.8. The reflection of the ancient Indo-European pantheon in Greek mythology

In Greek mythology, Zeus (*Zeús*, gen. *Diós*, also voc. *Zeû páter*), representing a direct continuation of Proto-Indo-European *t'yeu(s)-ph₂ther-, is the supreme god of the pantheon. He is the god of the clear sky who lives in the heavens (*aithéri naíōn*) and rules from on high (*hupsízugos*); he is 'aegis-bearing' (*aigíokhos*) and the progenitor of numerous gods and mythological beings. Functions 2b and 2c (above) of the second Indo-European deity, *pher(kho)u-no-, are transferred to Zeus in the Greek pantheon: the function of thunderer, association with lightning and high mountains, and the military function. He is the one who 'thunders on high' (*hupsi-bremétēs*), the 'gatherer of clouds' (*nephelē-geréta*), the 'thrower of lightning and thunderbolts' (*terpi-kéraunos*, *asteropētēs*), 'shining with lightning' (*argi-kéraunos*), the 'Olympian', inhabitant of Mount Olympus (*Olúmpie Zeû* 'O Olympian Zeus!', Iliad 1.508), 'ruler of battle' (*tamiēs polémoio*).

Thus the Greek Zeus combines all the basic functions of the two major Proto-Indo-European gods. This must be due to consolidation of various functions in one god, which may in turn reflect changes in early Greek society, including attenuation of the boundary between the priest and warrior classes (see Hocart 1970:304). Significantly, by Mycenaean times in Greece the priesthood was distinctly small, no longer having the status of a discrete privileged group. Ritual actions had begun to be performed by the head of the family or by members of the household (see Blavatskaja 1976:153-54).

The transfer of the functions of Indo-European ***pher(kho)u-no-** to ***t'yeu(s)-phHther-**, Gk. *Zeû páter*, resulted in the complete disappearance of ***pher(kho)u-no-** from the Greek pantheon and his replacement by Zeus. Only isolated functions of ***pher(kho)u-no-** came to be expressed by new, specifically Greek deities subordinate to Zeus: for example, the military function was fulfilled by Ares, the son of Zeus and his wife Hera; the artisan function of fire and forging by their son Hephaestus; and so on.

8.3.9. *The transformation of the ancient Indo-European pantheon in Italic tradition*

In Italic tradition, as in Greek, there is a redistribution of functions in the pantheon; but (unlike his Greek counterpart) the supreme Italic god Jupiter (*Jupiter/Iuppiter*), who directly continues PIE ***t'yeu(s)-phHther-**, does not take on all the functions of the second god ***pher(kho)u-no-** but acquires only function 2b, the connection with lightning and thunder. He is the 'king (*rēx*) of the sky', 'the father of gods and people', and also the thunder, 'shining with lightning' (form of address *Leucesie*, nom. *Lūcetius*: see Dumézil 1966:183ff.). However, unlike the Greek Zeus he has no military functions (function 2c) and no connection with war.²⁵ This function and that of economic activity and fertility, associated with ***pher(kho)u-no-** in the Proto-Indo-European pantheon, are entirely transferred to the Italic god (Roman) Mars, who functions in the Italic pantheon as god of war associated with horses,²⁶ god of resettlement,²⁷ and protector of agriculture²⁸ — although the name of the ancient Indo-European god ***pher(kho)u-no-** is completely lost in Italic.

Additional Roman protectors of economic activity are Quirinus and Ops (the latter literally 'abundance').²⁹ The relatively recent nature of these two gods can be seen in the fact that in the Umbrian Iguvine tables the place of Quirinus is taken by Uofione (Dumézil 1966:148, 155).

25. In ancient Rome the 'priest of Jupiter', the *flāmen Diālis*, was never supposed to see troops, sit on a horse, or see corpses or bloody flesh: see Dumézil 1966:158-59.

26. The horse sacrifice *Equus October* (see II.3.1.1.7 above) was dedicated to Mars and held on the Martian Field (*Campus Martius*): Dumézil 1966:160, 217-20, 277.

27. Mars was the protector of youths who had taken the vow of *uēr sacrum* 'holy springtime' and on coming of age were to move from their native territories to unsettled lands. Dumézil (1966:211) traces this custom to an ancient Indo-European one, which forced the Indo-Europeans to move farther and farther from their original territory.

28. The ancient Romans prayed to Mars for agricultural bounty and fertility. A prayer cited by Cato asks 'father Mars' (*Mars pater*) to protect the people from disease, prevent crop failures and famine, send growth and health to grains, vines, and plantings, and keep shepherds and livestock (*pāstōres pecuaque*) healthy: see Tronskij 1953:139.

29. Cf. the Old Hittite formula LUGAL-*i* *Pirwaš ḫappinaḫzi* 'to the king Pirwa gives wealth' (see II.7.3.1 above), with the verbal form *ḫappinaḫ-*, cognate to Lat. *Ops*. For the ritual use of PIE ***Hopb-** cf. also OHG *woba* 'holiday'.

It has already been mentioned that, despite the functional and etymological correlation of the first two gods in the various historical Indo-European traditions, the third deity, connected primarily with economic activity, does not show etymological unity across the historical traditions. This may be a further piece of evidence for the existence of two major gods in the Proto-Indo-European pantheon, gods who combined various functions and are reflected in somewhat transformed form in the daughter traditions, while the third element in the pantheon, associated with particular economic functions, developed only in the histories of the separate traditions.

8.3.10. *Traces of the ancient Indo-European pantheon in other Ancient European traditions*

For Baltic mythology we can reconstruct an opposition of two major gods, who continue the ancient Indo-European gods: Balt. **Deiwas* (OPruss. *deiws*, Lith. *diēvas*, Latv. *dievs* 'god'), who is described in Lithuanian and Latvian folklore texts as living in the sky; and Balt. **Perkūnas* 'thunder god' (Lith. *Perkūnas*, Latv. *Pērķūns*), who is regarded as having formerly lived on the earth but was taken up into the sky by **Deiwas* (see Skardžius 1964, Ivanov and Toporov 1974:21-22ff.).

Slavic mythology preserves the Indo-European thunder god and war god **Perunū*. He occupies the highest place, displacing the Indo-European supreme god, whose name is replaced in Slavic by an Iranian loan **bogŭ* (see Hamp 1978). The name of the Old Russian god *Stribog* (from **ptr-* + **bogŭ*) still reflects the status of highest Slavic deity, with the Slavic equivalent of PIE **t'yeu-* replaced by the Iranian word. However, in Old Russian tradition *Stribog* is no longer the supreme deity, but has functions evidently connected with certain natural phenomena. In this, as in the correspondents in Baltic myth, we can see a certain typological analogy to restrictions in Sanskrit tradition on the role of *Dyáuṣ pitā́*, who is displaced in the Vedic pantheon by *Indra*.

In Germanic and evidently in Celtic mythology, while the basic functional correlations of the Indo-European deities are generally preserved, their ancient Indo-European names are almost entirely replaced by recent innovations: see Polomé 1970. The supreme Germanic deity, who combines the functions of priestly god and leader of warriors, has the name *Odin*, OIcel. *Óðinn*, OE *Wōden*, OHG *Wuotan* (see Höfler 1974); the term comes from PIE **wāth-*: Lat. *uātēs* 'soothsayer, prophet', OIr. *fáith* 'prophet', etc. (Meid 1974:32, Pokorny 1959:1113). He is the god of magical knowledge, the master of runes, the leader of armies of the dead. The thunder god with military functions is *Thor*, OIcel. *Þórr*. In addition to *Thor*, the Old Icelandic pantheon still preserves a

deity *Týr*, who has legal functions; his name goes back to Germanic **teiwaz* (PIE **t'eiwos*), but he no longer ranks high in the pantheon (contrast the functions of the cognate Lith. *Diēvas* or the Old Russian *Stribog*"; see de Vries 1956:I, 1957:II, Tonnelat 1948).

In the ancient Celtic pantheon the same deities are represented by Gaul. *Lug* (the god of magic powers and leader in battle), OIr. *Dagda* (the supreme god of the druids), and others (see de Vries 1961, Vendryes 1948).

Chapter Nine

Reconstruction of Indo-European rituals. Legal and medical conceptions. The afterworld and burial rites

9.1. The general spiritual concepts and rituals of the Indo-Europeans

9.1.1. Ritual activity as the practice of the priestly class

In reconstructing Indo-European society we assume the existence of a social class of priests concerned with all of the diverse spiritual, legal, religious, and ritual activities. This presupposes an elaborated network of Proto-Indo-European terminology reflecting the activity of the priests and thus the legal, religious, and ritual norms of ancient Indo-European society.

9.1.2. Indo-European terms for basic religious concepts

The meaning 'believe, have faith' was expressed by the Proto-Indo-European phrase (and later compound) ***k̑ret'- d̑eH-**, literally 'place (one's) heart':

Skt. *śrad-dhā* 'faith', *śrad-dadhāti* 'believes, trusts' (cf. *śrāt te dadhāmi* 'I believe you', RV X, 147, 1), Avest. *zrazdā-* 'believe', Lat. *crēdō* '(I) believe', OIr. *cretim* '(I) believe'. Benveniste's doubts (1969:I.171-79) about the relation of ***k̑ret'- d̑eH-** to ***k̑her-t'-** 'heart', which gave him grounds for proposing a different etymology for the compound,¹ are not convincing in view of recent Hittite data where the compound *k(a)ratān dai-* 'insert core, heart' (from *k(a)rat-* 'core, inner part, inside' [common gender] beside *ker*, gen. *kardiyas*

1. Benveniste's doubts are due primarily to the formal difference of ***k̑ret'- in** ***k̑ret'- d̑eH-** from ***k̑er-t'-** 'heart': Gk. *kēr*, Hom. *kradīē*, Arm. *sirt*, Lat. *cor*, gen. *cordis*, OIr. *cride*, Goth. *halrtō*, OHG *herza* (Ger. *Herz*), OE *heorte* (Engl. *heart*), Lith. *širdis* 'heart, core', OCS *srūdīce* 'heart' (see Szemerényi 1970a) beside Skt. *hṛd-* 'heart', Avest. *zarad-* 'heart'. In Sanskrit and Middle Iranian, in contrast, the word Skt. *śrad-*, Pehl. *srāδ-* means 'guarantee, trust'. But this meaning must be regarded as derived from 'believe, have faith, trust', the meaning of the compound in question, and not vice versa; cf. the meaning of Lat. *crēditum* 'loan, debt, credit' as a derivative of *crēdō* '(I) believe, trust', etc. It is worth noting that in many languages 'heart' appears in phrases expressing disposition, trust, etc.: e.g. Russ. *serdce ležit k čemu-libo* 'is well disposed toward', lit. '(one's) heart lies toward', *doverjat' vsem serdcem* 'believe with all one's heart', ORuss. *vložiti v(") serdce* 'put in one's heart', etc.

'heart' [neut.]) appears: *nu-uš-ma-aš* DINGIRDIDLI-*eš ta-ma-i-in ka-ra-a-ta-an da-i-ir* 'and the gods put new insides in them' (KBo XXII 2 I 16). In PIE **k̑hret-* *dheH-* the old Indo-European word for 'heart' appears in State II, **k̑hr-et-* (active class), while as the name of the organ it appears in State I, **k̑her-t-* 'heart' (inactive class).

PIE **sakh-* 'holy; sanctify; rite': Hitt. *šaklai-* 'rite, ritual, sacred custom',² Lat. *sacer*, neut. *sacrum* 'sacred, holy, inspiring reverence' (e.g. *sacra publica* 'public rites; sacred holidays', *sacra gentilitia* 'sacred rites of a clan'). In Latin a series of derivatives is associated with this word: *sanctus* 'holy',³ with nasal infix; *sancio* '(I) consecrate, establish'; the compound *sacerdōs*, gen. *sacerdōtis* 'priest, priestess'; *sacrificāre* 'perform sacrifice' (the latter two from old compounds of *sacr-* with **dheH-* 'put').

PIE **eisHro-* 'endowed with sacred power; sacred': Skt. *iṣirá-* 'powerful, mighty' (pertaining to mythic beings), Gk. (Dor.) *hiarós*, (Att.) *hierós* 'sacred, strong, mobile'. Whether this word is admitted as Proto-Indo-European or not depends on how one regards its possible connection to the Italic forms Osc. *aisusis* 'sacrificiis', Umbr. *esono-* 'sacer, sacrificialis', Volsc. *esaristrom* 'sacrificium', but also Etruscan *aisuna, aisna, eisna* 'divine'. If the Italic forms are connected to Etruscan **ais-* 'god', they cannot be cognate to the Indo-European (Greek, Sanskrit) forms (see Benveniste 1969:II.197), which would cast doubt on the Proto-Indo-European nature of the word and turn it into a Greek-Indo-Aryan areal isogloss.

Another areal lexical isogloss meaning 'sacred; endowed with sacred power' may be represented by Avest. *spənta-* 'sacred', Lith. *šveñtas* 'sacred', OPruss. *swent-* (in compound names), Latv. *svinēt* 'sanctify, celebrate holiday', OCS *svetŭ* 'holy', Russ. *svjatoj* 'holy' (PIE **k̑hwen-tho-*, see also I.2.3.2n19). This word rhymes with the areal Indo-European word **swenthō-* 'strong, healthy', reconstructed on Germanic evidence: Goth. *swinþs* 'strong, healthy', OIcel. *svinnr* 'powerful, wise', OE *swīð* 'strong', OHG *gisunt* 'healthy' (Ger. *gesund*), OE *gesund* (cf. Engl. *sound*). That these words **k̑hwen-tho-* and **swenthō-* only rhyme and are not ultimately identical is shown (contra Watkins 1971:1502) by Lith. *šveñtas*, which requires initial **k̑hw-* and not **sw-*.

PIE **ayu-* 'life force; eternity; lifespan': Skt. *āyū-* 'life force', adj. *āyú-* 'mobile, strong', Avest. *āyū* 'lifespan', Hom. Gk. *aiei* 'always, constantly', *aiōn* 'life force, lifespan', Lat. *aeuus, aeuum* 'age, century, eternity', *aetās* 'age', *aeternus* 'eternal', Goth. *aiws* 'time, eternity, world', OHG *ēwig* 'eternal' (Ger. *ewig*). The Indo-European word, judging from the meanings of its derivatives in the daughter languages (especially Indo-Iranian and Greek), must have

2. E.g. in a hymn to the sun god: *ud-ni-ya-an-da-an ša-ak-la-in iš-ḫi-ú-ul zi-ik-pát ḫa-an-te-iš-ki* 'you establish the rite and treaty of the lands' (KUB XXXI 127 I 16-17).

3. E.g. *Sanctum est quod ab iniuria hominum defensum atque unitum est* 'what is protected and shielded from the people's infringements is sacred' (see Benveniste 1969:II.189).

denoted a cyclical life force which moved from one life to another and was connected with the idea of eternity: see Benveniste 1937. In addition, Indo-European words for 'youth, youngest' are formed from the same stem: Lat. *iouiste* (a religious epithet, cf. *iuuenis* 'young, full of strength'), Skt. *yáviṣṭha*- 'youngest' (Watkins 1975i).

PIE ***H₂ner-(th)-** 'life force, male strength': Hitt. *innarawatar* 'life force, highest power', *innarawant-* 'strong', Luw. *annarummi-* 'strong', *annarummahit-* 'life force' (≈ Hitt. *innarawatar*), Skt. *nár-* 'man, person', Avest. *nar-*; Skt. *sūnára-* 'full of life force; youthful', Avest. *hunara-* 'miraculous strength', Skt. *nṛtú-* 'hero', *sūnṛtā* 'life force' (cf. OIr. *so-nirt* 'strong', Welsh *hy-nerth* 'strong'), Oss. *Nart-* (hero of folk epos; see I.3.1.9 above); the ancient Germanic deity *Nerthus* (Polomé 1954, 1970:57-58), Arm. *ayr*, gen. *arñ* 'person, man', Gk. *anér* 'man', Hom. *ēnorée* 'manliness', Alb. *njeri* 'person, man', Lat. *neriōsus* 'strong', Welsh *ner* 'hero', *nerth* 'manliness', OIr. *nert* 'manliness'.

In Anatolian, ***H₂ner-(th)-**, which was connected with miraculous male strength in Indo-European, acquires the meaning 'life force' in general, thereby displacing PIE ***ayu-**, which is not attested in Anatolian and is replaced by derivatives of ***H₂ner-**. That both words existed in Proto-Indo-European with the specific metaphysical semantics indicated above is reliably established by comparison of the cognates in the historical Indo-European dialects. Apparently ***ayu-** meant 'youthful life force' while ***H₂ner-(th)-** meant 'masculine strength, maturity'.

9.1.3. Indo-European terms for religious rites

PIE ***arw-** 'pray, offer prayer': Hitt. *aruwaizzi* 'prays, bows', Hom. Gk. *aráomai* '(I) pray, offer prayer', *aré* 'prayer; curse' (from **arwā*), cf. Umbr. *arves* 'precibus' (Gusmani 1968:63-64).

PIE ***or-** 'supplicate, entreat gods': Hitt. *ariya-* 'establish with help of an oracle' (Kammenhuber 1976), Skt. *āryati* 'praises', Lat. *ōrāre* (*deōs*) 'pray to the gods; request, say', *ōrāculum* 'oracle' (originally 'place where gods were prayed to': Benveniste 1948a:120), Osc. *urust* 'ōrāverit', Russ. *orat* 'yell', Serbo-Cr. *ōriti se* 'resound'.

PIE ***muk-** 'pray; pronounce the words of a prayer': Hitt. *mugai-* 'pray', *mugawar* 'prayer', Umbr. *muga-* 'whisper; pronounce in low voice' (Gusmani 1968:64), cf. Lat. *con-mūgentō* 'conuocantō', '(I) call together', *mūgiō* 'moo' (cf. the meaning of Russ. *orat* 'yell' beside Lat. *ōrāre* 'pray', Hitt. *ariya-* 'establish with help of an oracle', above).

PIE ***meldh-** 'pray while offering sacrifice; offer prayerful words to gods': Hitt. *maldai-* 'pray; solemnly promise the gods to offer a sacrifice', Arm. *malt'em* '(I) pray', Lith. *meldžiū* '(I) pray', OCS *moliti* 'pray', ORuss. *molit'*

'pray while making sacrifice', OHG *meldōn* 'communicate, report' (Ger. *melden*), OE *meld* 'acquaintance' (Benveniste 1932b).⁴

PIE ***Heugho-/Hwegho-** 'praise solemnly while making sacrifice; offer prayer': Skt. *vāghāt-* 'one who prays during sacrifice; organizer of sacrifices', Avest. *aog-* (*aogādā*, *aoxta*) 'announce solemnly, pronounce', Gk. *eúkhomai* '(I) pray, solemnly promise, make a vow', *eukhē* 'entreaty, prayer, vow', Lat. *uoueō* '(I) solemnly promise, make vow, sacrifice', *uōtum* 'sacrifice, vow'. Apparently also connected to this set of words is Hitt. *huk-*/*huk-* 'conjure, pronounce invocation' (3sg. *hukzi*, 3pl. *hukanzi*). Formally this word goes back to a State II stem ***Hwegho-** (Hitt. *huk-*), with zero grade of the suffix in ***Hu-gho-** (Hitt. *huk-*);⁵ for the zero grade cf. Arm. *uzem* 'I want', *y-uzem* '(I) seek'.

This etymology justifies relating the Hittite word to Hitt. *huk-*/*huk-* 'split'. Regarding these Hittite words as semantic variants of a single word is justified by the semantics of the Indo-European source word: 'praise, offer prayer with sacrifice'. A semantic shift must be assumed for Hittite: 'praise, pray' > 'conjure', which could have resulted in semantic isolation of *huk-*/*huk-* 'split', originally 'divide up a sacrificial animal'.⁶

PIE ***k̑hens-** 'solemnly proclaim, prescribe, announce': Skt. *śámsati* 'praises, proclaims', *śámsa-* 'praise, prayer of praise, blessing; curse', Avest. *sānghaite* 'solemnly pronounces', OPers. *θātiy* 'says, proclaims' (e.g. in the Achemenid inscriptions: *θātiy Dārayavauš* 'thus says Darius', *aθaha* 'prescribed, instructed': see Benveniste 1969:II.147), Alb. *thom* '(I) say', Lat. *cēnseō* '(I) judge, evaluate, determine, maintain' (cf. Lat. *cēnsor* 'censor, magistrate', Osc. *kenzsur*, *keenzstur* 'censor', Skt. *śamstar-* 'one who solemnly proclaims'). Gk. *kósmos* 'order, world order' (see Watkins 1971:1522, 1524) may also be related to this set of words.

4. Szemerényi (1954) traces this word to the root ***mel-** 'say, pronounce' (Hitt. *malai-* 'approve', Gk. *mélōs* 'song').

5. The connection of Hitt. *huk-* and Lat. *uōx* 'voice', Skt. *vāk-* (PIE ***Hwek̑ho-**) proposed by Sturtevant 1933:80 meets with semantic and formal difficulties (the lack of geminate *-kk-* in the Hittite form). The lack of the expected final *-w-* in the Hittite reflex of PIE final ***-gho-** (Hitt. *huk-* instead of the expected **hukwu-*) can be explained as dissimilative loss (as is also the case if the Hittite word is related to PIE ***wek̑ho-**).

6. In contrast to the words just surveyed, whose Proto-Indo-European character is proven by the Hittite cognates, there are several words with analogous semantics which are restricted to individual dialect groupings (primarily Greek-Aryan and Ancient European): Skt. *yājati* 'honors with prayer and sacrifices', *ijyā* 'sacrifice', *yajñā-* 'reverence for the gods; sacrifice', Avest. *yazaiti* 'honors' (e.g. *yazamaide* 'we honor', opening formula for Avestan hymns and prayers: Thieme 1968e:204ff.), *yasna-* 'reverence for the gods, sacrifice' (name of part of the Avesta), Gk. *házmōi* '(I) fear (gods)', *hágios* 'holy, sacred', PIE ***yak-** (a Greek-Aryan dialect word); Lat. *uictima* 'sacrificial animal, sacrifice', Goth. *weihs* 'sacred', OHG *wīh*, *wīhi* 'sacred' (cf. OHG *wīhen nahen* > Ger. *Weihnachten* 'Christmas'), OE *wēoh*, *wīg* 'image of god' (PIE ***weik̑h-**, an Italic-Germanic lexical isogloss in its ritual meaning); Lat. *faueō* 'reverently keep silence, regard with favor', OCS *govějŕ* '(I) honor, worship' (in religious sense), cf. Russ. *govet'* 'fast and attend service before confession and communion' (PIE ***ghou-**, an Italic-Slavic isogloss in its religious sense).

PIE ***naH-** ‘fear, revere (gods), be ashamed’: Hitt. *naḥ-* ‘fear, revere, venerate’, *naḥḥan* ‘respect, veneration’,⁷ *naḥḥant-* ‘fearful, careful’,⁸ *naḥṣariya-* ‘be afraid’, *naḥṣaratt-* ‘fear, veneration’, OIr. *nár* (from **nā-sro-*) ‘fearful, timid’, *náire* ‘shame’. The formal correspondence of Anatolian and Celtic shows that the root is Proto-Indo-European. Anatolian exhibits the original meaning and Celtic a secondary development, following general semantic typology: ‘fearful, respectful, reverent’ > ‘ashamed’ but not vice versa.

The set of Proto-Indo-European words connected with reverence for the gods and sacrifices to them includes a number of other formations surveyed in II.6.4.6 above in connection with words pertaining to sacrifices (‘sacrificial animal’, ‘food’, ‘drink’).

PIE ***k̑en-/*k̑n-** in the active or middle with suffix and preverb: ‘acknowledge, become aware; acknowledge guilt or sin’: Hitt. *kaneš-* ‘acknowledge, identify; acknowledge guilt or sin’ (e.g. *nu-mu wašdul-mit teddu n-e-z-an kaneš-mi* ‘let him [i.e. my god] name my sins and I will acknowledge them’); Ved. *prati-jñā-* ‘acknowledge, confess’; Gk. *suggignōskō* ‘(I) realize’ (*súgggnōthí moi* ‘let me realize’), Lat. *agnōscō* (< *ad-* + *-gnō-*) ‘(I) acknowledge, realize’, OE *oncnāwan* ‘acknowledge’, Lith. (*pri*)*pažinti* ‘acknowledge’, Latv. *pazīt* ‘recognize’, *atzīt* ‘acknowledge (one’s mistakes)’, OCS *sъznati* (*sę*) ‘confess’, Russ. *soznavat’(sja)* ‘confess’, Alb. *njoh* ‘know, recognize; acknowledge (rights)’, see Watkins 1978.

9.1.4. Indo-European terminology for fortunetelling rites

The Proto-Indo-European ritual terminology for foretelling the future is reflected in words connected with fortunetelling rites:

PIE ***sāk-** ‘recognize by signs; ask (the gods’ will)’: Hitt. *šagai-* ‘omen, sign’, *šakiya-* ‘reveal (by means of oracle)’, Lat. *sāgus* ‘prophetic’, *sāga* ‘woman diviner’, *praesagium* ‘presage’ (see Kammenhuber 1976:196), OIr. *saigim* ‘(I) try to find out, seek’, Goth. *sōkjan* ‘seek, judge’, OE *sæcan* (Engl. *seek*), OHG *suohhen* (Ger. *suchen*) ‘seek’, cf. Gk. *hēgéomai* ‘(I) lead, am leader’. That the primary sense in Indo-European was a ritual one is evident from Hittite and Latin, two ancient traditions where the practice of divining and ascertaining the gods’ will survived until historical times. In Germanic the word acquired the more general sense ‘inquire, try to find out’, in part becoming a legal term: OIcel. *sök* ‘legal matter, case’, OE *sacu* ‘lawsuit, legal case’ (Engl. *sake*), OHG

7. E.g. in the autobiography of Hattusilis: *A.NA DIŠTAR GAŠAN.YA naḥḥan ešdu* ‘may there be respect for Ištar, my lady’.

8. E.g. in the ‘Instructions to Temple Servants’: *mekki naḥḥanteš eštin* ‘be very careful (with fire)’.

sahha ‘legal case’ (Ger. *Sache*), etc. Gk. *hēgēomai* underwent a different semantic development to acquire the meaning of leadership.

PIE ***Ho-** ‘consider true, believe an omen’: Hitt. *ḫa-* (1sg. *ḫami*) ‘believe, consider true or reliable’, Lat. *ōmen* ‘sign, omen, solemn custom, rite of augury’ (e.g. *ōmen ... accipere* ‘accept as true’: Benveniste 1962a:11). On dialect-geographical grounds the Hittite-Italic lexical correspondence justifies reconstructing the word in roughly the Hittite-Latin meaning for Proto-Indo-European.

9.1.5. *Indo-European legal and ritual terminology*

Proto-Indo-European legal terminology is inextricably bound up with ritual terminology, which shows that the law was inseparable from the ritual conceptions that determined the legal norms of the ancient Indo-Europeans. The legal norms of the society were part of the ritual system, controlled by priests who combined the functions of directing spiritual activity and regulating basic societal norms.

PIE ***yewo-** ‘establishment, ritual rule, ritual norm’: Skt. *yóḥ* ‘health, success’ (in the phrase *sám yóḥ* ‘happiness and health’), Avest. *yaoždā-* ‘bring into accord with cultic norm’ (from **yaoš + *dā-* ‘put’), *yaoždāti-* ‘ritual purification’ (Benveniste 1969:II.113); OLat. *iūs* (Lat. *iūs*, gen. *iūris*) ‘law, system of rules, power’, *iūstus* (OLat. *iouestōd*) ‘just, fair, legitimate, in accord with the law’, *iūrō* ‘(I) swear, take oath’, OIr. *huisse* ‘fair, legitimate’ (from **yus-tyos*, Pokorny 1959:512). The Aryan-Italic-Celtic correspondence makes the word in its legal and ritual sense reconstructible for Proto-Indo-European.

PIE ***t^heiḱh-** ‘design, predestination, indication, direction, law’: Hitt. *tekkuššai-* ‘indicate, present’ (*ištarna tekkuššai-* ‘distinguish (from others), mark, legalize’), *tekkuššanu-* ‘indicate, observe, present’ (Friedrich [1952]:220), Skt. *diśāti* ‘points out, marks’, *diṣṭi-ḥ* ‘indication, prescription’, *diśā* ‘direction’, Gk. *deiknūmi* ‘(I) show, indicate’ (cf. Hitt. *tekkušša-nu-*), *díkē* ‘right, sign, portent (of a god)’ (see Palmer 1950:158), *dikas-pólos* ‘one who makes judgment; judge’, *díkaios* ‘just, fair, decent’, Lat. *dīcāre* ‘solemnly proclaim; dedicate, sanctify, sacrifice’,⁹ *iūdex* ‘judge’,¹⁰ Goth. *ga-teihan* ‘show, announce’ (cf. *taikns* ‘sign, miracle’, OHG *zeihhan* ‘sign’, Ger. *Zeichen*, OE *tæcan* ‘teach’, Engl. *teach*),¹¹ OHG *zeigōn* ‘indicate’ (Ger. *zeigen*).

9. The meanings of the Latin word still show a connection to its original ritual and religious semantic background.

10. A compound of **yeu-t + *deik-* meaning ‘one who shows the law, the prescriptions’.

11. The Germanic forms show a reflex of ***ḱ^h** which has not undergone spirantization because it goes back to an unaspirated allophone: see I.1.4.3 above.

PIE ***leikʰ-** 'bind, swear oath, swear, bind in obligation': Hitt. *lingai-*, *lingan* 'oath': *linkiyaš* DINGIRMEŠ 'gods of oath', *linkiyanteš* 'gods of oath' (Oettinger 1976:41); Lat. *ligō* '(I) bind, join', *obligatiō* 'obligation', *alligō* '(I) fasten, bind, oblige' (*lex alligat* 'the law obliges', *caput suum alligāre* 'guarantee with one's own head', etc.), see Gusmani 1968:64. For other dialect forms cf. Gk. *loigōntían · phratrían* (Hesychius), Lith. *laigōnas* 'wife's brother', Ukr. *polygatysja* 'come into contact, strike up friendship with someone'.

PIE ***mHr-/n-(th)-** 'hand, power; put into (someone's) possession, govern': Hitt. *maniyahḫ-* 'hand over, turn power over, rule', *maniyahḫai-* 'government, power',¹² cf. LÚ*maniyahḫatalla-* 'ruler, deputy', Lat. *manus* 'hand, power, control, possession', *aliquid in manu alicuius ponere* 'put something into someone's possession', lit. 'put something into someone's hand', *manus uiri* 'husband's power over wife' (cf. *in manum autem feminae tantum conueniunt* 'only women go over into [someone else's] power', see Watkins 1970a:325), *mandō* '(I) give over' (from **manu-* + **dhē-*; for the semantics cf. Hitt. *maniyahḫ-*, Umbr. *manuv-e* 'in the hand, in manu', Mlr. *montar*, *muinter* 'legal wife', Olcel. *mund* (fem.) 'hand', *mundr* (masc.) 'bride price and the husband's guardianship obtained on its payment', OE *mund* 'hand; defense', OHG *foramundo* 'guardianship' (Ger. *Vormund*, cf. Ger. *mündig* 'of age, major': Paul 1956:II.710); cf. Gk. *márē* 'hand' (the same as *kheír*, according to commentators on Homer), cf. Hom. *márptō* 'seize, hold'.

Thus the Indo-European protoform can be reconstructed with the meaning 'hand' as a symbol of power, as is reflected in Anatolian, Italic-Celtic, and Germanic. In a number of dialects the word still retains the meaning of 'hand' proper (Italic, in part Greek). The word for 'hand as symbol of power' was opposed to ***ǵhes-ṛ-/ǵhes-tho-**, which meant 'hand' strictly as a body part. In the historical dialects the meanings of the forms are redistributed, with one of them acquiring a specialized sense: in Anatolian ***ǵhes-ṛ-** continues to be used in the sense 'hand as body part' (as is true of Gk. *kheír*: see II.8.1.8), while ***mHr-/n-** is preserved only in derivatives in the metaphorical sense 'power, government' (and in the sense 'hand' in the Greek relic word *márē*). In Italic, ***ǵhes-ṛ-** is displaced and ***mHr-/n-** becomes the basic word for 'hand' as both body part and symbol of power.

PIE ***serkh-** 'compensate a loss': Hitt. *šarnink-* 'compensate for loss' (due to theft, damage), 'redeem guilt (before god)', *šarnikzel* 'compensation, redemp-

12. E.g. in the archaic ritual KUB XXIV 1 I 17-18, 23-24: LUGAL-*i-ma-mu* DINGIRMEŠ DUTU-uš DIŠKUR-aš-ša ut-ne-e É-ir-mi-it-ta ma-ni-ya-aḫ-ḫi-ir ... LUGAL-*ú-e-mu* ma-ni-ya-aḫ-ḫa-en GIŠḫu-lu-ga-an-ni-en GIŠDAG-iz a-ru-na-za ú-da-aš 'and the sungod and thundergod gave me, the king, the country and my house over to my power ... the [deified] Throne brought me, the king, my royal power — a carriage — from beyond the sea'.

tion of guilt',¹³ Lat. *sarciō* '(I) compensate (for damage)' (cf. *noxiam sarcīre* 'compensate for damage' in archaic legal contexts; see Watkins 1970a:329); also etymologically related to this root is Hom. Gk. *hórkos* 'oath', *hórkion* 'oath, sacrificial prayer'.

9.1.6. The distribution of ritual and legal terms by dialect area

The dialect distribution of the Indo-European legal and ritual terms is worth remark. The basic words of this set, and the special ritual and legal senses of Proto-Indo-European words, are generally restricted to Anatolian and Italic. This is true of **sakh-* 'sacred', **or-* 'entreat gods', **mukh-* 'pray', **sāk-* 'recognize (the will of the gods)', **Ho-* 'consider true', **leik-* 'bind in obligation', **serkh-* 'compensate (damages)'; cf. also the Celtic and Anatolian sharing **naH-* 'fear, revere'. This restriction could be explained as due to loss of the corresponding words in the other dialects, or at least loss of the specific relevant meanings in retained lexemes.¹⁴ If so, these words would have to be reconstructed for the Proto-Indo-European stage in their specialized ritual and legal senses.¹⁵ On the other hand, it could be that at least some of these words represent an Anatolian-Italic (and Celtic) isogloss restricted to a particular dialect area within Proto-Indo-European. Then we would be dealing not with Proto-Indo-European words but with words characteristic of the Anatolian-Italic-Celtic dialect area of Proto-Indo-European. Support for the second hypothesis comes from words which are to all appearances Proto-Indo-

13. E.g. in the 'Prayer of Mursilis during a time of plague', KUB XIV 14 Rs. 19-20: *am-mu-uk-[m]a šu-ma-a-aš A.NA DINGIRMEŠ ENMEŠ.Y[A] šar-ni-ik-zi-el maš-kán-na KUR-e ... še-ir šar-ni-in-ki-iš-ki-mi* 'and I will bring you, gods, my lords, expiation and gifts for the sake of the country' (lit. 'I will redeem redemption'). In the Hittite Laws the word is used in connection with compensation for theft, Hitt. *taya-* 'steal' (for Indo-European terms for theft and property see II.7.3.3).

14. A word from the same semantic field is **Has-* 'ritual hearth, altar' (Hitt. *hašša-*, Lat. *āra*, see II.6.4.4 above), reflected with altered meaning in Sanskrit: *āśa-* 'ashes' (cf. also Olcel. *arinn* 'raised firebed'). Another is **sphe/ont-* 'perform sacrificial libation, offer sacrifice' (Hitt. *šipant-*, Lat. *spondeō*, Gk. *spéndō*, see II.4.2.1.6 above; the word is lost from the other dialects).

Ritual terms dialectally restricted to Anatolian and one western branch include the following, found in Anatolian and Germanic: Hitt. *talliya-* 'solemnly appeal to a god for help': Olcel. *þulr* 'performer of sacred ritual speech'; Hitt. *alwanza-* 'spell': Runic Norse *alu* 'magic spell'; etc. (see Polomé 1975).

15. Analogous problems arise with other areally restricted legal and ritual terms, whose reconstruction as Proto-Indo-European requires correspondences from outside the given area. For instance, the set of legal terms Ir. *dligim* '(I) am entitled to', *dliged* 'debt', Goth. *dulgs* 'debt', OCS *dlügü* 'debt' justifies positing a Celtic-Germanic-Slavic dialect term; but their possible etymological connection to an Indo-Iranian ritual and legal term (Iranian **drang-* 'guilt, responsibility', etc.: see Perixanjan 1973:469-74) moves the word back to the Proto-Indo-European stage.

European but take on specialized ritual and legal terminological senses only in Anatolian-Italic and are consequently represented in these meanings only in Anatolian and Italic.

An Indo-European word that is revealing in this connection is **wer-* ‘look, pay attention, be careful’: Gk. *óromai* ‘(I) look after someone’, *hórei* · *phulássei* (Hesychius) ‘guards’, Hom. *oûros* ‘watchman’, *horáo* ‘(I) see’, Goth. *war(s)* ‘careful’, OE *wær* ‘careful, attentive’ (Engl. *aware*), OHG *giwar* ‘careful, attentive’, *biwarôn* ‘guard’ (Ger. *bewahren*); Goth. *daúrwards* ‘doorkeeper’ (cf. Ger. *Torwart*), OHG *wart* ‘watchman’, *wartēn* ‘pay attention, await’ (Ger. *warten*), Latv. *véru* ‘(I) look, notice’. In Hittite and Latin — and hence in the Anatolian-Italic dialect area — the word acquires the specialized meaning ‘fear’ (in ritual sense): Hitt. *werite-* ‘fear, tremble’,¹⁶ *weritema-* ‘fear, fright’,¹⁷ Lat. *uerērī* ‘revere, fear, worship’; cf. OIr. *có(a)ir* ‘appropriate, correct’, which may reflect a specialized ritual and legal meaning.

9.1.7. The Indo-European word for ‘blood feud’

We can also distinguish Indo-European cognates with legal and ritual semantics which, while clearly dating back to Proto-Indo-European and represented in almost all branches, are missing in Anatolian and Italic. A clear example is **khoe/oi-(nā-)* ‘punish, compensate, pay price, avenge’: Skt. *cáyate* ‘avenges’, *cetár-* ‘avenger’, *ápa-citi-* ‘retribution’ (cf. Gk. *apótisis* ‘payment, vengeance’), Avest. *kāy-* ‘pay, compensate’, *kaēnā-* ‘redemption; punishment, retribution’, Hom. Gk. *tínō* ‘(I) pay, compensate, punish, avenge’, *tísis* ‘payment, punishment, vengeance, redemption’, *poinē* ‘retribution, vengeance, blood feud, payment for murder’, Lith. *káina* ‘price, payment’ (including bride price), OCS *cěna* ‘price, payment’ (cf. Avest. *kaēnā-*, Gk. *poinē*, Lith. *káina*), *kajq sę* ‘(I) repent’.

Semantic comparison of this set of words suggests that Indo-European had an undifferentiated legal and ritual concept of payment or compensation. A blood feud was the same kind of compensation — payment for blood — as compensation for damages or payment for a bride.

In Anatolian, however, the general concept of compensation is subdivided into various categories, each with its own special label. Payment for blood is expressed by *ešhar šanh-* ‘thirst for blood’ (used of the gods, i.e. ‘demand that a person take blood vengeance’, e.g. in the Telepinus text: DINGIRMEŠ *ešhar šanhir* ‘the gods are thirsty for blood’). Bride price was *kušata-*, compensation

16. E.g. in a divination text, KUB VIII 1 II 4: *ta-me-ta ú-e-ri-ti-iz-[zi]* ‘in another place he will tremble’.

17. E.g. in a Middle Hittite hymn to the sun, KUB XXXI 127 I 59-60: ZAG-*az-te-it na-aḫ-ša-ra-at-eš ḫu-i-ya-an-te-eš* GÜB-*la-az-ma-at-ta ú-e-<ri>-te-ma-aš ḫu-i-ya-an-te-eš* ‘to your right are spreading horrors, to your left spreading terrors’.

for damages incurred was *šarnikzel*, and ‘payment, price (of an object)’ was also expressed by another archaic term, *happar* (see II.7.3.1).

In Italic tradition the ancient undifferentiated Indo-European **k^hoei-(nā)* ‘payment, compensation, vengeance’ was lost, evidently displaced by the evolution of the elaborate Latin system of legal terminology with its differentiated payment, compensations for damage, and redemption of guilt.¹⁸

9.1.8. Ritual and legal formulas containing roots with very general meanings

In addition to the specialized lexemes surveyed above, we can also reconstruct whole Proto-Indo-European formulas of a ritual and legal nature, expressed by derivatives of **es-* ‘be’, **d^heh-* ‘put’, and similar basic verbs.

PIE **s(o)nth-* (participial form of ‘be’) ‘true, real, having actually done’ > ‘guilty’: Hitt. *ašant-* ‘correct, true’, Skt. *sánt-*, *sát-* ‘true, real’, *satyá-* (**sⁿthyo-*) ‘truth’, Avest. *haiθya-* ‘true, faithful’, *hant-*, *hat-* ‘true’, Gk. *tà ónta* ‘truth, reality, property’, Lat. *sōns* ‘guilty’ (Watkins 1967a), Germanic **sanþa-*: OHG *sand*, OSax. *sōð* ‘true, real; one whose guilt is beyond doubt’, OE *sōð* ‘true, real’ (Engl. *sooth*); Goth. *sunja* ‘truth’ (from **sunðja-z*), OE *synn* ‘sin’ (Engl. *sin*): Watkins 1971:1515.

PIE **d^heh-m-* (derived from **d^heh-* ‘put, place’) ‘pertaining to the ritual or legal establishment’: Skt. *dhāman-* ‘sacred law, custom’, Hom. Gk. *aná-thēma* ‘ritual’ (‘songs and dances during feast’), ‘sacred gift’, *thémis* ‘law, sentence, rights’ (cf. *hè thémis estín* ‘as is proper, authorized’), *Thémis*, god of jurisprudence; Goth. *dōms* ‘sentence, glory’, *dōmjan* ‘sentence’ (*ō* ablaut grade), OE *dōm* ‘sentence, fate’ (Engl. *doom*), OHG *tuom* ‘sentence, custom’. The underlying root **d^heh-* itself also has ritual and legal meaning in a number of phrases such as **k^hret-* *d^heh-*, **yew(o)- d^heh-* (see 9.1.2 and 9.1.5 above). Also relevant are formulaic expressions with ritual meaning such as Hitt. *ŠAPAL NÍŠ DINGIRMEŠ dai-* ‘place under the oath of the gods’, Skt. *nāmadhā-* ‘giver of names’ (from *nāma* + *dhā-* ‘give a name’, lit. ‘put a name’), Gk. *onomathētēs* ‘name-giver’, Hitt. *laman te-* ‘call by name’, and others.

PIE **ar-(tho-)* ‘fit, correspond, unite’, in its ritual and legal meaning ‘be fitting, appropriate; conform to what has been established’: Hitt. *ara* ‘according to law’, *UL ara* ‘is not appropriate, not according to the law’, *ḪAra-* ‘Good, Right’ (the deified concept of propriety: Otten 1958:98-99), Skt. *ṛtá-* ‘sacred law; established principle’, Avest. *arata-*, OPers. *arta-* ‘law, right, sacred law’, Avest. *aša-* (= **arta*) ‘what is fitting, conforms to the law’, Gk. *ársion* · *díkaion* ‘fair, just’ (Hesychius), *an-ársios* ‘inimical’.

18. Latin, like Hittite, also lacks the specialized term for ‘payment’ derived from **k^hoei-* / **k^hor-(ei-)* (see II.7.3.2 above), which may well ultimately go back to the same root **k^hoei-*.

9.2. Indo-European medical terminology. Medicine as part of the ritual system

9.2.1. The general term for ritual healing in Indo-European

Another word belonging to the broad spectrum of ritual and legal notions is ***met'-**, attested in the historical dialects in numerous derivatives having to do with mental activity, law, ritual, and medical treatment: Skt. *masti-* 'measurement, weighing', Arm. *mit* 'thought, reason', Hom. Gk. *médomai* '(I) think, think over, contemplate', Lat. *meditor* '(I) meditate', Umbr. *meřs, mers* 'law, ius', *mersto* 'just, iustum', Osc. *med-díss* 'judge, iudex', OIr. *midíur* '(I) meditate, judge, make legal decision', *mess* 'legal procedure', *med* 'scales', Goth. *mitan*, OE *metan*, OHG *mezzan* 'measure' (Ger. *messen*), Oícel. *mjǫtuðr* 'fate'. The meanings of the word also include 'wise man, healer, curer': Avest. *vī-mad-* 'doctor, healer', e.g. *vī-mādayanta* 'they should give medical treatment', Gk. *Médē, Médeia* 'Medea' (i.e. 'healer'), *Agamédē*; Lat. *medeor* '(I) treat, give treatment, cure', *medicus* 'doctor' (Pokorny 1959:706).¹⁹

9.2.2. Structure of rituals for treating disease

The Proto-Indo-European conception of medicine and the treatment of disease was still closely connected to ritual.²⁰ Curing and restoring health were seen as the function of special rituals performed in accord with prescribed rules.²¹

19. In individual historical Indo-European traditions the function of healing is carried out by special gods, sometimes sun gods: the Sanskrit Ashvins, *dévyā bhiṣájā* 'divine healers' (see Ward 1968), as well as Varuna and Rudra (Puhvel 1970b), the Greek Apollo and his son Asclepius, the special Old Prussian healing god Auschauts (lit. 'driving out disease': Toporov 1975:I.165-66), Gaulish healing deities (de Vries 1961:78-80).

20. The Proto-Indo-European word for 'be sick' (i.e. 'experience the harmful action of a power hostile to people') is reconstructed as ***s(th)erk'-** with two meanings, 'guard, take care (of a sick person), love' and 'be sick': Gk. *stérō* '(I) love, take care of' (e.g. parents taking care of children), OIr. *serc* 'love', OLith. *sérgmi* 'watch over', Lith. *sárgas*, Latv. *sāfgs* 'guard, watchman', OCS *stražŭ*, Russ. *storozh* 'guard, watchman' beside Hitt. *ištark-* 'be sick' (in constructions such as *antuḥṣan ištarakzi* 'a person will get sick', lit. 'will make a person sick', usually said of the goddess Ishtar, who sends illnesses: Burde 1974:12-16), Toch. A *sārk*, B *sark* 'illness', Lith. *siřgti* 'be sick', Latv. *sirgt* 'be sick', OIr. *serg* 'illness' (see Toporov 1975:I.52). The combination of these two meanings in one word can be explained by a shared original ritual meaning 'guard a sick person against hostile forces', cf. Russ. *storozhit' bol'nogo* 'watch over a sick person', etc. A possible Proto-Indo-European word for 'take care of a sick person' is reconstructed as ***sokhtho-**: Hitt. *ṣaktaizzi* 'takes care of a sick person', Mlr. *socht* 'stupor' (see Watkins 1975d).

21. The Indo-European word for 'health' is ***sol(w)-**: Toch. A *salu* 'whole', B *solme* 'whole', Skt. *sārva-* 'unharméd, integral, all', *sarvātāti-* 'fact of being unharméd, health', Avest. *haurva-*, OPers. *haruva-* 'unharméd, whole', Avest. *haurvatāt-* 'wholeness, perfection, success', Arm. *ořj* 'healthy, whole', Gk. *hólos* 'perfect, whole', Hom. *oũlos* 'whole, unbroken', Lat. *salūs* 'fact of being unharméd, health', *saluus* 'whole, unharméd, healthy', Umbr. *sal(u)uom* 'saluum', Alb. *ngjáll* 'bring to life, make healthy'. A dialectally restricted word with

Analysis of the relevant ritual texts from various Indo-European traditions allows us to reconstruct the earliest Indo-European conceptions of conjuring and treating disease in order to rid people of their ailments. We can also partially reconstruct the earliest views of physiology, anatomy, human body parts, and especially the anatomy of (sacrificial) animals. The enumeration of body parts to some extent determines the structure of curing rituals in various Indo-European traditions, including Hittite. For Sanskrit and ancient Germanic see Kuhn 1968[1864]:11ff.; also Schlerath 1968a:325ff., Puhvel 1970b:379, 382. For the Hittite ritual of Tunnawi see Goetze 1938, Burde 1974, and for structurally analogous Luwian rituals Laroche 1959a:149.22

9.2.3. *Indo-European names for body parts*

In addition to paired body parts such as **ĝhes-r-/ *ĝes-tho-* ‘hand’, **phe/ot-* ‘foot’, **še/okho-* ‘eye’, **bhruH-* ‘eyebrow’, and **o(H)us-* ‘ear’ (surveyed in II.8.1.9), and **k̥her-t-* ‘heart’ (see note 1 to this chapter), we can reconstruct the following Proto-Indo-European words for human or animal body parts.

PIE **thoekh-* ‘body; body part; membrane, skin’: Hitt. *tuekka-* ‘body, individual’ (Kammenhuber 1965),²³ *tuekkes* (pl.) ‘body parts’, Skt. *tvacas-* (nom.), Ved. *tvák-* ‘skin, hide, membrane, cover, surface’, Hom. Gk. *sákos* ‘shield’ (made of leather or hide); for the phonetic correspondence of Hitt. *tw-* and Gk. *s-* see I.2.4.6 above.

PIE **k̥h(e)rHs-r/-n-* ‘head; location of thoughts and brain’:²⁴ OHitt.

the similar meaning ‘healthy, unharmed’ is **k̥hai-lo-*: Goth. *hails*, Oícel. *heill*, OHG, Ger. *heil* ‘healthy, whole’, OE *hāl* (Engl. *whole*); OHG *heil* ‘health, success’, OE *hæl* ‘favorable omen’ (cf. Welsh *coel* ‘omen’), OPruss. *kailüstiskan* (acc.) ‘health’, OCS *čelŭ* ‘healthy, whole, unharmed’.

22. Luwian rituals and their Hittite analogs enumerate the ‘twelve body parts’ (Hitt. XII UZUŪRH.A, Luw. XII *happišati* beside Hitt. *happešsar* as a reading of UZUŪR: Otten 1953a:100); mentioned first is IV-*tī pa-a-ar-ta-tī* (KUB XXXV 43 Rs. III 24) ‘four parts (of an animal)’: see Laroche 1959a:80. Luw. *parta-* ‘part (of body)’, cognate to Hitt. *parš-* ‘cut apart, divide into parts, split’, can be compared to Lat. *pars*, gen. *partis* ‘part’ (cf. also OIr. *rann* ‘part’); cf. also the formally corresponding Ved. Skt. *pūrti-* ‘rich offering’, evidently a sacrificial offering (Pokorny 1959:817), and the semantically close Skt. *pārśu-*, Avest. *parəsu-* ‘rib’, Oss. *fars* ‘side’ (Abaev 1949:I.18). An analogous image of twelve basic body parts is attested in Celtic tradition in Old Irish medical texts, where the ‘twelve gates of the soul (or life)’ are the twelve basic body parts in which disease can be fatal (Meid 1974:28).

23. A Hittite ritual for the treatment of eye diseases (KUB XXXIII 66 Vs. II 16ff.) enumerates body parts beginning with A.NA DUMU.LÚ.ULÛ.LU-*ma tu-ik-ki-iš-ši* ‘the human son has in his body’. Then the body parts are enumerated in this order: head (*šaršan-*), eye (*šakuwa*), *walula-* (?), white of eye (*hark-i-*), forehead (*hant-*), eyebrows (*enera-*), and eyelashes (*laplīpa-*).

24. Words for ‘skull’ and ‘brain’ are restricted to areal terms which cannot be regarded as definitively Proto-Indo-European. One example is Gk. *brekhmós*, *brékhma* ‘front part of head’ beside OE *brægen*, Engl. *brain* (see Pokorny 1959:750, Watkins 1971:1500, 1530); cf. also

ḥaršar, gen. *ḥaršanaš*, Late Hitt. *ḥaršan-* ‘head’,²⁵ Ved. Skt. *śīrṣán-*, gen. *śīrṣṇāḥ* ‘head; location of thoughts’ (see Grassmann 1873:1398), Gk. *kárā* ‘head’ (from **k̑hr̥Hs-ṇ* > **karaa*), *karára* · *kephalē* (Hesychius) from **karasra*, Lat. *cerebrum* ‘brain’ (from **k̑her̥Hs-ro-*, cf. Gk. *karára*). Alternating forms in *-r/-n-* are found within a single paradigm only in Old Hittite; Late Hittite and the other early Indo-European dialects — Sanskrit, ancient Greek, Latin — generalize one or the other form: that in *-r* for Lat. *cerebrum* and Gk. *karára*, that in *-n-* for Late Hitt. *ḥaršan-*, Skt. *śīrṣán-*, Gk. *kárā*.²⁶

PIE **men-* ‘thought, mind, reason; think, remember’: Toch. A *mnu* ‘thought’, B *mañu* ‘desire’, Skt. *mánaḥ* (Avest. *manah-*) ‘thought’, *mányate* ‘thinks’, Avest. *mainyeite* ‘thinks’, Hom. Gk. *menoináo* ‘(I) desire eagerly, strive for, design, purpose’, *mémōna* ‘(I) remember’ (cf. *ménos* ‘fury, anger’), Arm. *i-manam* ‘(I) understand’, Lat. *mēns*, gen. *mentis* ‘mind’, *meminī* ‘(I) remember’, OIr. *menme* ‘mind, state of mind, expectation, desire’, *do-moiniur* ‘I think, believe’, Goth. *muns* ‘thought, opinion’, *munan* ‘think, intend’, *ga-munds* ‘memory (of)’, OIcel. *munr* ‘thought, wish’, OE *ge-mynd*, OHG *gi-munt* ‘memory, recollection’, Lith. *menù* ‘(I) think’, *mintis* ‘thought’, OCS *mǐnjǫ* ‘(I) think’, *pamęti* ‘memory’. Thought or mind or soul (*ištanzana-*) as a part of the human body still figures in Hittite burial rituals which enumerate the souls of various body parts (see II.1.2.3 above).²⁷

PIE **Hanth-* ‘forehead, front part of head, face’: Hitt. *ḥant-* ‘forehead, front part’, cf. Lat. *antiae* ‘hair falling on forehead’ (from **Hanthyo-*, cf. OIcel. *enni*, OHG *andi* ‘forehead’), OIr. *étan* ‘forehead’; in most other dialects the word is used only in the meaning ‘fore, front part’: Homeric Gk. *antí* ‘in front of, face to face’, *eis-ánta* ‘in the face’, Lat. *ante* ‘before’, cf. Hitt. *ḥanti* ‘before, separately’, Goth. *anda-* ‘against’, OHG *ant-* (cf. Ger. *Antlitz* ‘face’).

PIE **nas-* ‘nose’: Skt. *násā* (du.) ‘nose’ (lit. ‘nostrils’), Avest. *nāh-* ‘nose’, OPers. *nāham* (acc. sg.) ‘nose’, OLat. *nāsum*, Lat. *nās(s)us* ‘nose’ (with expres-

Toch. A, B *mrāc* ‘head’; PIE **mregʰ-*. Another is Toch. A *māsśunt* ‘marrow’, Skt. *mājjan* ‘marrow’, *mastīṣka-* ‘brain’, *mástaka-* ‘skull’, Avest. *mazga-* ‘brain, marrow’, OHG *mar(a)k* (Ger. *Mark*), OE *mearg* (Engl. *marrow*), OIcel. *mergr* ‘marrow’, OPruss. *musgeno* ‘marrow’, OCS *mozgŭ* ‘brain, marrow’.

25. Hittite evidently underwent dissimilative substitution of the initial **k* in prehistoric times: Hitt. *ḥaršar* < **k̑arḥsar* < PIE **k̑hr̥Hsor/n-*.

26. Another, areally restricted, word for ‘head’ is **k̑baphuth-*, **k̑baph-el-*: Skt. *kapúccchala-* ‘hair on temples’, Lat. *caput* ‘head’, OIcel. *haufuð* ‘head’, OE *hēafod* (Engl. *head*) beside Goth. *haubiþ* ‘head’, OHG *houbit* (Ger. *Haupt*) ‘head’; Skt. *kapāla-* ‘skull, cup’, OE *hafola* ‘head’. There is also an old dialectal form reconstructible as **g̑bebʰ-(e)l-*: Toch. A *spāl* ‘head’, Hom. Gk. *kephalē* ‘head’ (also ‘top’ in Greek), Goth. *gibla* ‘pediment, roof of house’, OHG *gibilla*, *gebal* ‘skull’.

27. For typological perspective on this classification of thought and mind as body parts, see the similar systems described for a number of contemporary ‘primitive’ peoples in Franklin 1963.

sive -ss-), OHG *nasa* 'nose' (Ger. *Nase*), OE *nasu* 'nose' (formerly dual, 'nostrils'), Lith. *nósis* 'nose', OCS *nosŭ* 'nose'.²⁸

PIE **ois-/oHs-/ous-th-* 'mouth, lips':²⁹ Hitt. *aiš*, gen. *iššaš* 'mouth', Skt. *āḥ* 'mouth', Avest. *āh-* 'mouth', Lat. *ōs*, gen. *ōris* 'mouth, face', Mlr. *á* 'mouth'; Skt. *ōṣṭha-* 'lip', Avest. *aošta-* 'lip', Lat. *ōstium* 'entry, mouth of river', OPruss. *austo* 'mouth', *āustin* (acc. sg.) 'muzzle, mouth', Lith. *úostas* 'mouth of river', OCS *usta* 'mouth', Russ. *ust'e* 'mouth of river, orifice' (see Toporov 1975:I.172-73).

PIE **t'ng̃bhuH-* 'tongue', both as body part and organ of speech:³⁰ Toch. A *kāntu*, B *kantwo* (with metathesis of the stops), Skt. *jihvā*, Avest. *hizū-*, *hizvā-* 'tongue' (Benveniste 1954a:30-32), Arm. *lezu*, gen. *lezui* 'tongue', OLat. *dingua*, Lat. *lingua*, Osc. *fangvam*, OIr. *teng* 'tongue' (alongside *ligur* 'tongue'), Goth. *tuggō* 'tongue', OE *tunge* (Engl. *tongue*), OHG *zunga* 'tongue' (Ger. *Zunge*), Lith. *liežūvis* 'tongue', OPruss. *insuwis* 'tongue', OCS *językŭ* 'tongue'.³¹ (See also Hilmarsson 1982 and Winter 1983, where several dialectally distributed protoforms are proposed for Indo-European.)

PIE **(e)t'-onth-* 'tooth' (a participial form of **et'-* 'eat', hence 'eater'):³² Skt. *dán*, acc. *dāntam* 'tooth', Avest. *dantan-* 'tooth', Gk. *odón*, gen. *odóntos*, Lat. *dēns* (from **dnt-s*), gen. *dentis*, Osc. *dunte[s]* (abl.), OIr. *dét*, Goth. *tunþus*, OHG *zand* (Ger. *Zahn*), OE *tōð* (Engl. *tooth*), Lith. *dantis* 'tooth'; cf., with a different suffix, Arm. *atamn* 'tooth'.³³ A number of dialects have replaced the original word with an innovation derived from **k'em-bh-* 'tear apart, break to pieces': Toch. A *kam*, B *keme* 'tooth', Alb. *dhēmb*, Geg *dām* 'tooth', Latv. *zūobs*, OCS *zqbŭ* 'tooth'; cf. also Skt. *jám̐bha-* 'tooth, eyetooth', Gk. *gómphos* 'bolt, dowel', OHG *kamb* 'comb' (Ger. *Kamm*), OE, Engl. *comb* (lit. 'toothed').

28. In many languages the word for 'nose' is tabooed because of its associations and replaced with words originally meaning 'smell, sniff': Skt. *ghrāṇā* 'nose' from *ghrāui* 'smells, sniffs'; OE *nosu* (Engl. *nose*) from the root of OE *nēosian* 'sniff, smell, smell out', which is cognate to Russ. *njuxat'* 'sniff, smell'.

29. The phonetic variability of the original form can be explained by its expressive character and its association with notions that are usually tabooed (cf. the tabooing of 'nose' just mentioned).

30. A protoform reconstructed from correspondences in part of the Indo-European dialects. In other dialects the original form is phonetically reshaped by partial expressive and euphemistic alteration, due to various associations which led to tabooing of the word (see Havers 1946:123ff.).

31. In Anatolian the word is replaced by an expressive formation: Hitt. *lala-*, Luw. *lali-* 'tongue'.

32. This may have been a descriptive term for 'tooth' which arose as a euphemistic replacement for an earlier word.

33. The Hittite reading of the Sumerogram KAXUD is unknown. Hitt. *adant-*, which corresponds formally to the words for 'tooth' elsewhere in Indo-European, is a participial form, neutral in voice, meaning 'eaten, eating'. Hittite has an innovation *gagaš* 'tooth', which Laroche (1973:90-91) compares to OHG *hāko* (Ger. *Haken*) 'hook', OE *hōc* (Engl. *hook*). However, the word could also come from Sum. *gag* 'peg'. A Sumerian loan could have entered Hittite via some other language.

PIE ***k̑enu-** 'jaw, chin': Toch. A *śanwem* (du.) 'jaws', Skt. *hānu-* 'jaw', Avest. *zānu-*, Gk. *gēnus* 'chin, jaw', OIr. *gi(u)n* 'mouth', Welsh *gen* 'cheek, chin', Goth. *kinnus* 'cheek', OE *cinn* (Engl. *chin*), OHG *kinni* 'chin' (Ger. *Kinn*). Hitt. *ganu-* 'jaw' (?) (see Watkins 1972a) may also belong to this set.

PIE ***mono-** 'back of head, occiput; neck': Skt. *mānyā* 'back of head', Mitann. *mani-(nni)* 'necklace', Avest. *minu-* 'necklace', *manaoθrī-* 'neck, back of head', OPers. *bara-man-* 'one who wears a necklace', Mayrhofer 1974:290-91 (cf. Lat. *monile* 'necklace'), OIr. *muin-* 'neck', *muinél* 'neck', cf. OIcel. *mōn*, OE *manu* (Engl. *mane*), OHG *mana* (Ger. *Mähne*) 'mane', OCS *monisto* 'necklace'.

PIE ***phl(e)u-mon-** 'lungs' (etymologically 'floating', from the root ***phleu-** 'float',³⁴ see II.5.3.8 above): Skt. *klóman-* 'right lung', Gk. *pleúmōn* 'lung', Lat. *pulmō*, gen. *pulmōnis*, Lith. *plaūčiai*, Latv. *plāuši*, OPruss. *plauti* 'lungs', OCS *plušta* (pl.), ORuss. *pljuča* 'lung'; cf. also the words for 'breath, soul' discussed in II.1.1.2 above.

PIE ***spheľgh-** 'spleen': Skt. *plīhān-*, Avest. *spərəzan-*, Arm. *p'aycatn*, Gk. *splēn* 'spleen' (cf. Hom. *splágkhna* 'entrails of sacrificial animals', Odyssey 3:9 and elsewhere), Lat. *liēn*, OIr. *selg*, Slav. **selezenī*, Russ. *selezenka* (see Pokorny 1959:987).³⁵

PIE ***yekhor/n-th-** 'liver': Skt. *yákṛt*, gen. *yaknáḥ*, Avest. *yākarə*, Pers. *jigar*, Gk. *hépar*, gen. *hépatos* (*-ṇ-tos), Lat. *iecur*, gen. *iecoris* and *iecinoris* (from **iecinis*), Lith. *jāknos*, Latv. *akna* 'liver'. Another group of dialects has initial *l-* together with other taboo alterations: Hitt. *lišša-* 'liver', Arm. *leard*, gen. *lerdi*; also Germanic forms: OIcel. *lifr*, OE *lifer* (Engl. *liver*), OHG *libera*, *lebara* (Ger. *Leber*). In view of these forms, OPruss. *lagno* need not be a misspelling of *iagno* (see Ernout and Meillet 1967:307).

PIE ***g̑hel-** 'bile' (from 'yellow': see II.6.5.11): Hom. Gk. *khólos* 'bile; anger, spite', Lat. *fel*, gen. *fellis* (from **fel-n-is*) 'bile, bitterness, anger', OIcel. *gall* 'bile, poison', OE *gealla* (Engl. *gall*), OHG *galla* (Ger. *Galle*) 'bile', Russ. *želč* (beside OCS *zličī*) 'bile'. The dialect distribution of the word in the meaning 'bile' (Greek-Latin-Germanic-Slavic) justifies reconstructing it with this meaning for Proto-Indo-European.

PIE ***esHr/n-(th) / *esHr/n-(kh)** 'blood': Hitt. *ešhar*, gen. *ešhanas* 'blood', Luw. *ašhanuwantiš* 'bloody', Toch. A *ysār*, B *yasar* 'blood', Skt. *ásṛk*, *ásṛt*, gen. *asnáḥ*, Ved. *asṛjā*, Arm. *ariwn* 'blood', Gk. (poet.) *éar*, *eíar* 'blood', OLat. *aser* (*asser*), *assyr* 'blood', Latv. *asins* 'blood'.

PIE ***t'ak̑hru-** 'tears': Toch. A *ākār*, pl. *ākrun* 'tears', B *akrūna* 'tears', Skt. *ásru* 'tears', Arm. *artasuk* 'tears', Gk. *dákru*, *dákrūma* 'tears', Lat. *lacrima*, OIr.

34. The image of lungs as floating organs is understandable, since lungs do indeed float. This organ name is obviously based on empirical observation.

35. The historically attested forms exhibit taboo deformation and hence do not yield a strict formal correspondence.

dér, Welsh *deigr*, pl. *dagrau* ‘tears’, Goth. *tagr* ‘tears’, OE *tæhher*, *tēar*, *teagor* (Engl. *tear*), OHG *zahar* (Ger. *Zähre*), Lith. *āšara*, *ašarà* ‘tear’ (see Hamp 1972a).³⁶ The word for ‘tear’, like ‘tongue’, shows varying phonetic reflexes in the historical dialects; the discrepant initial *t-, *l-, and *Ø- across the dialects may reflect variability due to the expressive nature of the word.³⁷

PIE **sneu-r/-n-* ‘tendon, sinew’: Toch. B *šñor*, pl. *šñaura* ‘tendons, sinews, nerves’, Skt. *snāvan-* ‘tendon, sinew’; cf. the -*r-* stem of Skt. *a-snāvirá-* ‘without sinews’, Avest. *snāvarə* ‘tendon, sinew’, Arm. *neard* ‘sinew, fiber’, Hom. Gk. *neûron* ‘sinew, bowstring’ (made of ox sinews), *neurē* ‘bowstring’, Lat. *neruus* ‘tendon, sinew, nerve; body part, hide’.

PIE **qhe/os-th-* ‘bone’: Hitt. *ḫaštai* ‘bone’, cf. É *ḫešta-* ‘house of bones’ (also *ḫaštiyaš* É), Luw. *ḫašša-* (pl.) ‘bones’, Lat. *costa* ‘rib’, OCS *kostī* ‘bone’; Skt. *ásthi* ‘bone’, Avest. *asti-* ‘bone’, Gk. *ostéon* ‘bone’, Lat. *os*, *ossis*, ‘bone’ (for the initial correspondence of Hitt. *ḫ-*, Lat. *c-*, Slav. *k-* : Skt., Gk., Lat. Ø- see I.2.4.6 above).

PIE **k’œlbh-* ‘womb, fetus, young of animal’: Ved. Skt. *gárbha-* ‘womb, fetus, newborn, offspring’, Avest. *garəbuš* ‘young of animal’, Gk. *delphús* ‘womb’, Hom. *adelphéos* ‘brother’ (Gates 1971:14, lit. ‘from the same womb’, cf. Skt. *sá-garbhya-ḥ* ‘eodem utero natus’, ‘born from the same womb’), *délphaks* ‘piglet’, *delphís*, gen. *delphínos* ‘dolphin’, *dolphós* · *hē métra* ‘womb’ (Hesychius). If Hitt. *ḫuelpi-* ‘young of animal’, ‘young, fresh’ (Friedrich 1952:70) is cognate (and cf. Germanic words for ‘young animal’: OHG [*h*]welf, Ger. *Welf*, OE *hwēlp*, Engl. *whelp*), then the Indo-European protoform must be reconstructed with initial **q’o-*.

PIE **nobh-/ṇbh-* > **ṇbh-* (with assimilation) ‘navel’: Skt. *nābhi-* ‘navel, kinship’, *nābhya-* ‘hub, nave of wheel’ (as the figurative navel of the wheel), *nābhīla-* ‘hollow of navel, lower part of body’, Avest. *nabā-nazdišta-* ‘most closely related, next of kin’, Hom. Gk. *omphalós* ‘navel, boss of shield, knob of yoke’, Lat. *umbilicus* ‘navel’, *umbō*, gen. *umbōnis* ‘boss of shield’, OIr. *imbliu* ‘navel’, OHG *naba*, OE *nafu* ‘nave of wheel’, OHG *nabalo* (Ger. *Nabel*), OE *nafela* (Engl. *navel*), Oícel. *nafli*, OPruss. *nabis* ‘navel’, Latv. *naba* ‘navel’.

PIE **p̥hes-os-* ‘penis’: Skt. *pásas-*, Gk. *péos*, Lat. *pēnis* (from **pesnis*), OHG *fasel*, OE *fæsl* (see Weitenberg 1975).

PIE **orǵh-i-* ‘testicle’: Hitt. *arki-* ‘copulate’, Avest. *ərəzi* (du.) ‘testicles’, Arm. *orji-k’* ‘testicles’, *mi-orj-ik’* ‘having one testicle’ (Gk. *mónorkhis*), Gk. *órkhis* ‘testicle’, OIr. *uirgge* ‘testicle’, cf. Russ. *erzat’* ‘fidget, move restlessly’ (Watkins 1975h; see II.2.1.2.2n7).³⁸

36. In some dialects the word for ‘tear’ is formed from ‘blood’: Hitt. *ešḫaḫru-* ‘tears’, *ešḫaḫruwa-* ‘cry’, Skt. *ásram* ‘tear’; cf. also Avest. *asrū-* ‘tear’, Latv. *asara* ‘tear’.

37. For references see Van Windekens 1976a.

38. Another dialect word for ‘copulate’ is **eibh-/yebh-*: Skt. *yábhati*, Gk. *oiphéō*, Russ. *jeti*.

PIE ***ors-** ‘buttocks’: Hitt. *a-ar-ra-aš*, Arm. *or*, Gk. *órros*, OHG *ars*, OE *ears* (Engl. *arse*), OIcel. *ars*, cf. OIr. *err* ‘tail, back of chariot’, with semantic shift.

PIE ***āno-** ‘anus’, also ‘ring’: Hitt. *anna-* (Friedrich and Kammenhuber 1975:I), Lat. *ānus*, OIr. *áinne*, cf. Arm. *anur* ‘necklace, ring’; see also Poetto 1979:205.

PIE ***seHur-** ‘liquid coming from human or animal body; urine’: Hitt. *šeḫur* ‘urine’, Toch. B *sūrme* ‘eye disease’, OIcel. *saurr* ‘animal semen; mud’, *súrr* ‘sour, sharp’, Latv. *sūrs* ‘salty, bitter, astringent’, Slovene *sirōv* ‘raw, uncooked; crude’.

PIE ***sk̑her/n-(t’-)** ‘feces’ (human or animal): Hitt. *šakkar*, gen. *šaknaš*, *zakkar*, gen. *zaknaš* ‘feces’, Avest. *sairya-* ‘fertilizer, manure’, Pehl. *sargēn* (Pers. *sargīn*), Gk. *skōr*, gen. *skatós* ‘feces’, Lat. *mūscerda* ‘mouse droppings’, *sūcerda* ‘pig manure’, *būcerda* ‘cow manure’, *ouicerda* ‘sheep manure’, OIcel. *skarn*, OE *scearn* ‘manure’, cf. Latv. *sārņi* ‘menstruation, feces’, Lith. *šārvai* ‘menstruation’ (but see Fraenkel 1962-1965:II.966), Common Slavic **sūrati* ‘defecate’, Russ. *sor* ‘litter, sweepings’ beside *skared* ‘stingy person’ (Vasmer 1964-1973:III.634, 720).

PIE ***meu-/*mu-** ‘semen, sperm’: Hitt. *muwa-* ‘male semen; fruit-bearing liquid’, Gk. *muelós* ‘spinal cord’ (Hom. *muelòn andrōn* ‘men’s spinal cord’, Odyssey 2:290); see Poetto 1979:207.

9.2.4. The ritual identity of human and animal body parts. Conjury

The reconstructed terminology for body parts and organs and their functions in humans and animals indicates that the Indo-Europeans had a fairly well-developed understanding of the structure of the human body. Originally this knowledge must have been based on familiarity with the internal parts of animals, especially sacrificial animals, whose bodies were divided up into particular sections. The fact that most terms for body parts and organs are identical for humans and animals shows that the Indo-Europeans identified human body parts with those of animals. This must have led to a transfer of terms for parts of animals to their human counterparts. The identification of human and animal body parts also explains the custom, widespread in antiquity, of treating human diseases by ritual manipulation of the corresponding organs of animals and by conjuration connected with these magical actions.

Individual early historical Indo-European traditions preserve rituals of animal sacrifice connected with healing rituals for people. Old Hittite tradition shows relatively recent types of healing which are close to actual medicinal practice: bloodletting (Hitt. *iš-ḫar ar-ḫa tar-na-i* ‘(he) lets blood out’, KUB XLIV 63 II 8ff.), treatment with lead (A.BÁR, KUB XLIV 61 Rs. IV 27’; this

may have been a treatment for venereal disease, as is supported by Akkad. UZUI.ŠA.RI.ŠU 'penis' and Hitt. *paššari-* (?) in the same context, IV 19'-27'). However, rites of treatment involving conjury are also preserved (see Burde 1974:1-11). The doctor pronounced a conjuring formula several times; cf. Hitt. LU.A.ZU *hukkiškizzi* 'the doctor conjures', IBoT I 36 II 46.39

Stereotyped conjuring formulas consisting of enumerations of the body parts and organs being treated⁴⁰ are extremely archaic and may in part reproduce ancient conjury formulas going back to the Proto-Indo-European era.⁴¹

Other ritual fragments of Proto-Indo-European conjury are the formally and semantically corresponding Old English and Hittite-Luwian 'conjuries against misfortunes', where, after several abstract designations of dangers threatening humans, there is a concluding reference to 'tongue of the crowd' or 'human slander':

Old English:

<i>and wið andan</i>	'and against malice'
<i>and wið æminde</i>	'and against envy'
<i>and wið þā micelan mannes tungan</i>	'and against the great tongue of a man'
	(Meissner 1916, Spamer 1978)

Luwian:

<i>tatarriyaman</i>	'curse'
<i>ḥirun</i>	'perjury'
<i>mayaššin</i> EME-in	'tongue of the crowd' (or 'of an adult')
	(Laroche 1959a:65, 149-50)

39. There are possible traces of an Indo-European word meaning 'conjure, treat, cure' and 'entreat, pray': Hom. Gk. *akéomai* '(I) treat, cure, repair, assuage thirst', *ákesma* 'remedy, herb', Gk. *akéstōr* 'healer, savior' (epithet of Apollo), *akestēr* 'doctor, healer', OIr. *hicc* 'recovery, healing', Welsh *iach* 'healthy': PIE **yeHk̑b-*/**yHk̑b-*. See also Pokorny 1959:504 for the possible connection to **yekb-* 'say, entreat, solemnly utter': Toch. B *yāsk-* 'ask, entreat', A *yāšsuce*, B *yāšsūca* 'beggar', Skt. *yācati* 'asks, entreats', Lat. *iocus* 'joke' (cf. Lith. *juōkas* 'joke'), Umbr. *iuka* 'prayer', Osc. *iúklel* 'in consecratione', OHG *jehan* 'say, pronounce', *jihl* 'acknowledgment', *bijihl* (Ger. *Beichte*), cf. Ger. *Gicht* 'gout' (lit. 'disease brought on by slander').

40. There are other enumerations of body parts and internal organs in Hittite ritual texts, e.g. UZUGAB 'chest', UZU^hahri- 'lungs, diaphragm', UZUNÍG.GIG 'liver', UZUŠA 'heart', UZU^hpantuhan 'stomach', UZU^harraš 'buttocks' (KUB VII 1 III 16ff.); or ŠA.ŠU 'his heart', *genzu-šet* 'his genitals' (?), *genu-šet* 'his knee', Q.A.TI.ŠU 'his hands' (KBo XV 10 I 24ff.); and others (see Burde 1974:41-42). These Hittite enumerations, like those of other Indo-European traditions, may reflect a belief that curing a person involved making him or her whole by successive enumeration of all his or her body parts, a procedure that finds widespread analogs in many folk traditions (see Puhvel 1970b:379); note also the semantic connection of 'heal, cure' with 'whole, integral', above.

41. In addition to the practice of conjuring observed in a number of traditions and reconstructible for Proto-Indo-European, there are similar conceptions, primarily in Sanskrit and Greek traditions, about the healing or harmful functions of various elements: air or wind, water, fire (Esser 1935, Kirfel 1951; see Benveniste 1945). Rather than being Proto-Indo-European, this Sanskrit-Greek correspondence may go back only to the later Greek-Aryan dialect grouping (see also Puhvel 1970b:369-71).

Hittite:

DINGIRMEŠ-aš *karpin*
pangauwa EME-an

‘anger of the gods’
 ‘and language of the crowd (gathering)’

9.2.5. *The correspondence of body parts to parts of the universe in the conceptions of the ancient Indo-Europeans*

Conjuncture could also be based on the assumption of a correspondence between human body parts, parts of the universe, and the basic social divisions. In a number of the earliest Indo-European traditions, the universe is viewed as having originated from the parts of a sectioned sacrificial animal, and hence is perceived as a model of the human body. The clearest expression of this view is represented by Sanskrit tradition, in the Vedic hymn to Puruṣa,⁴² a mythic person from whose body parts the universe is created. There are also parallels in other traditions: Iranian, Germanic, Slavic.

The Vedic hymn first mentions the sectioning of Puruṣa into parts: *yāt pūruṣam vy ādadhuḥ katidhā vy ākalpayan mūkham kīm asya kau bāhū kē ūrū pādā ucyete* ‘When they divided Puruṣa up, how many parts did they divide him into? How are his mouth, his hands, his thighs, his feet called?’ (RV X, 90, 11). By way of answer the four social classes, *varnas*, are named as having originated from the four body parts: *brāhmaṇo ’sya mūkham āsīd bāhū rājanyāḥ kṛtāḥ ūrū tād asya yād vaiśyāḥ padbhyām śūdrō ajāyata* ‘His mouth became the brahman, his hands became the rajanya,⁴³ what had been his thighs became the vaiśya,⁴⁴ from his feet were born the śūdras’.⁴⁵ The origin of the universe is described in terms of the sectioning of Puruṣa’s body (RV X, 90, 13-14):

candrāmā mānaso jātāś cākṣoḥ sūryo ajāyata
mūkhād indraś cāgnīś ca prāṇād vāyūr ajāyata
nābhya āsīd antārikṣam śīrṣṇō dyāuḥ sām avartata
padbhyām bhūmir dīśaḥ śrōtāt tātā lokān ākalpayan

‘The moon was born from (his) spirit, the sun was born from his eyes.
 From his mouth Indra and Agni, from his breath the wind was born.
 From his navel was born the airy space, from his head the sky formed.
 From his feet the earth, the directions from his ear.
 Thus they formed the world.’

42. For the Vedic Puruṣamedha rite (lit. ‘human sacrifice’) and its proposed Indo-European prototype, see II.1.3.2 above.

43. The Rajanyas correspond to the kṣatriyas, the group to which the ruler, *rājan-*, belonged in ancient India.

44. Skt. *vaiśya-* ‘varna of farmers’, from *viś-* ‘village’.

45. Skt. *śūdrā-*, the *varna* comprising all artisans in ancient times (see II.8.2.2 above).

Analogous cosmogonic motifs which coincide with the Sanskrit images in points of detail at the level of the mythologeme are found in ancient Germanic tradition, and in part elsewhere — in Iranian, Italic, and Slavic — which may indicate that they are very ancient and go back to Proto-Indo-European (see Ebenbauer 1974, Lincoln 1977). In Old Icelandic tradition, the Elder Edda describes the parts of the universe as having arisen from the body parts of the mythic sacrificial being Ymir:

*Ór Ymis holdi vas jörð of sköpuð,
en ór beinum björg,
himinn ór hausi ens hrímkalda jötuns,
en ór sveita sær*

‘The flesh of Ymir became the earth,
the bones became mountains,
the skull of the rime-cold giant became the sky,
and his blood the sea.’

(*Váfþrúðnismál*, 21)

9.2.6. *The conception of humans as having originated from the earth*

The view that the universe and human society were created from the divided parts of a human body, which is still preserved in the ancient daughter traditions and evidently goes back to Proto-Indo-European (see Toporov 1973a), is markedly distinct from the creation myths found among ancient Near Eastern and especially Mesopotamian traditions — Sumerian, Akkadian, and Hurrian (and Late Hittite, under their influence): see Littleton 1970. However, it should be noted that a number of mythic motifs, including that of the original unity of humans and the earth, are shared by Semitic and Indo-European tradition. In this connection, the etymological identity of ‘human being’ and ‘earth’ in Indo-European is revealing: PIE **dh(e)ǵhom-* means both ‘earth’ and ‘human, person’ (etymologically ‘earthly, of the earth’):

‘Earth’: Hitt. *tekan*, gen. *tagnaš*, Toch. A *tkam*, gen. *tkanis*, B *kem*, Skt. *kṣam-*, Avest. *zqm* (acc.), Gk. *khthōn* (with metathesis in the zero-grade forms: see I.2.6.4 above), Alb. *dhé*, Lat. *humus* ‘earth, soil’, OIr. *dú*, gen. *don* ‘place’, Lith. *žemė*, Latv. *zeme*, OPruss. *same*, *semmē*, OCS *zemlja* ‘earth’ (forms which simplify the initial consonant cluster by losing either the first or the second consonant).

‘Person, human’: Toch. A *śom* ‘youth’, B *śaumo*, pl. *śāmna* ‘person’, Lat. *homō*, gen. *hominis* ‘person’ (OLat. *hemō*, acc. *hemōnem*), Osc. *humuns* ‘homines’, Umbr. *homonus* ‘hominibus’, Goth. *guma*, OIcel. *gumi*, OE *guma*, OHG *gomo* ‘person, man’ (cf. Ger. *Bräuti-gam* ‘bridegroom’), OLith. *žmuo*

'person', OPruss. *smoy*, *smūnents* 'person', *smūni* 'individual', cf. OIr. *duine*, Welsh *dyn* 'person'.

A number of ancient Indo-European dialects replace the original word for 'person' with innovations such as Hitt. *antuḫšaš*, Luw. *ziti-*, Skt. *pūruṣa-*, *pūms-/pūmāms-*, Gk. *ánthrōpos*, Myc. *a-to-ro-qo* (Morpurgo 1963:43), etc.

9.3. Conceptions of the afterworld; burial rites

9.3.1. The Indo-European view of death as an inevitable fate

Linguistic data and evidence from rituals in a number of ancient Indo-European traditions make it possible to reconstruct ancient Indo-European conceptions about dying, death, and the afterworld. Death is seen as a predestined misfortune which overtakes humans. In such a view, death can be equated with fate, as can be concluded from the semantics of the Proto-Indo-European word for 'death' as reflected in the historical dialects:

Henk̑h-**/Hneḱh-** 'death, plague, fate, compulsion': Hitt. *ḫenkan*, gen. *ḫinganaš* 'plague, pestilence, dying, death',⁴⁶ Hom. Gk. *anáḡkē* 'compulsion, inevitability, fate' (reduplication of ***Hn̑k̑h-**), OIr. *écen*, Welsh *angen* 'necessity, need'. The State II stem is represented by Toch. A *nāk-* 'disappear, perish', B *nāk-, nek-* 'destroy, perish', Skt. *náśyati* 'dies, disappears', Avest. *nasyeiti* 'disappears, dies', *nas-* 'need, misfortune', *nasu-* 'corpse', Gk. *nékūs*, gen. *nēkuos* 'corpse', Lat. *nex*, gen. *necis* 'death, killing', *necō* '(I) kill' (OIr. *éc* 'death'), Bret. *negein* 'kill'.

9.3.2. The drink of the gods which overcomes death

No human means could avert death. Only a special drink, ***Hneḱh-tḡH-**⁴⁷ 'death-overcoming',⁴⁸ which belonged to the gods, could save the person who

46. In Hittite, *ḫenkan* 'death, plague, pestilence, epidemic' is connected with the idea of universal or general death. When this misfortune befalls the country, the king makes constant prayers to the gods, asking them to stop the death and leave the few not yet afflicted with the disease alive (Goetze 1929).

47. PIE ***tḡerH-**/***tḡH-** 'conquer, overcome': Hitt. *tarḫ-* 'defeat', Skt. *túrai* 'defeats, conquers, struggles' (cf. Ved. *viśva-túr* 'defeating all', *pṛtsu-túr* 'victorious in battle', *āji-túr* 'winning in battle').

48. PIE ***Hneḱh-tḡH-** is regularly reflected in Greek as Hom. *néktar* 'fragrant red beverage of the gods':

Οἱ δὲ θεοὶ παρ Ζηνὶ καθήμενοι ἡγορόωντο
Χρυσέῳ ἐν δαπέδῳ, μετὰ δέ σφισι πότνια Ἥβη
νέκταρ ἐφωχόει (Iliad 4.1-3)

'Now the gods at the side of Zeus were sitting in council
over the golden floor, and among them the goddess Hebe
poured them nectar as wine'

drank it from death (Thieme 1952, 1968a).⁴⁹ The gods who owned this drink of immortality were classified as ***ṇ-mṛtho-** ‘immortal’, in contrast to humans, who were ***mṛtho-** ‘mortal’ (see II.1.2.5).

9.3.3. The afterworld as a pasture

The ancient Indo-Europeans’ conceptions of the afterworld and the life of human souls (***dheu-H/s-** and ***anH-**, see II.1.1.2) in it were determined by the pastoral nature of their society, whose essential features were transferred to the world of the dead. The afterworld was seen as a pasture where human souls dwelled among those of sacrificial animals.

A Hittite royal burial rite, KUB XXX 24 Vs. II 1-6, contains archaic prayers said by the priestess known as ‘the Old Woman’, SALŠU.GI:

1. *ku-un-na-wa-aš-ši* Ú.SAL^{LAM} DUTU-uš *a-a-ra i-ya-an ḫar-ak*
2. *nu-wa-ra-aš-ši-ša-an* šar-ri-iz-zi ḫa-an-na-ri *le-e*
3. *ku-iš-ki nu-wa-aš-ši-kán* *ke-e-da-ni* A.NA Ú.SAL GUDḫI.A UDUḫI.A-ya
4. ANŠE.KUR.RAMEŠ ANŠE.GÌR.NUN.NAḫI.A *ú-še-ed-du*
‘O sun god! Make him a pasture (Hitt. *wellu-*) for right and good.
May no one take it away from him or dispute his right to it.
And may bulls, sheep, horses, and mules be pastured
on this field for him.’⁵⁰

Analogous views of the afterworld as a pasture where livestock graze can be observed in Indo-Iranian tradition. In the Rigveda, the burial hymn to Yama calls the world of the dead *gávyūti-* ‘pasture (for cattle)’:

yamó no gātúm prathamó viveda náišā gávyūtir ápabhartavā ul
yātrā naḥ pūrve pitāraḥ pareyúr enā jajñānāḥ pathyā ánu svāḥ!
‘Yama was the first to find (root *ved-/vid-*) our path,
This pasture (*gávyūti-*) is not to be taken back!⁵¹
Where our fathers once went,
There the living (reborn) will find their way’ (RV X, 14, 2)

49. That the verb ***t^h(e)rH-** could be combined with a word meaning ‘death’, as is assumed by the etymology of the compound ***Hnek^h-t^hrH-** (Gk. *néktar*), can be demonstrated with the Vedic example *tarāṇi mṛtyúm* ‘may I overcome death’ (*Atharvavedasamhitā* IV, 35); see Schmitt 1967:190, but cf. Knobloch 1967, where Gk. *néktar* is compared to Hitt. *nink-* ‘drink’ and etymologized as simply ‘beverage’.

50. Cf. also *ma-a-an-wa-kán* Ú.SAL-wa *pa-a-i-ši* ‘when you go to pasture’ (lit. ‘to the meadow’: *welluwa* [dir.]), in the same Hittite funeral ritual (KUB XXX 19 Rs. IV 13; see Otten 1958:139).

51. Cf. the strikingly similar meaning of *le kuiški šarrizzi* ‘may no one take it away’ (of a pasture, *wellu-*) in the Hittite funeral hymn cited above.

The passage concerns the Indic king Yama (*Yama-rāja-*), ruler of the afterworld, originally the first man and a twin (see II.8.1.3) who was the first to know death. His Avestan correpondent is the king Yima (*Yimō Xšaētō*),⁵² who owned 'wonderful herds' (*hvaθwō*, see Yasna 9.5; Thieme 1968c:148) and is associated in myth with the origin of pastures (see Dumézil 1971:247). In an Avestan hymn representing the prayer of the Soul of the Ox (*gāuš urvan-*, see II.1.1.2), the soul appeals to the gods and exclaims, *nōiṭ mōi vāstā xšmāṭ anyō* 'I have no other herder than you' (Yasna 29.1): see Duchesne-Guillemin 1973. This archaic prayer finds a counterpart, and partial textual correspondence, in the Hittite formula *Ḫ[U]TU ŠA.ME.E EN.YA ŠA DUMU.LU.ULÜ.LU LÚú-e-eš-ta-ra-aš* 'heavenly sun god, my lord, shepherd of humanity' (KUB VI 45 III 13; 46 III 52), with Hitt. *weštara-* 'shepherd' corresponding to Avest. *vāstar-* 'shepherd' (Benveniste 1962a:99-100); cf. *wešiya-* 'pasture' (verb) in the funeral rite cited above.

In agreement with the shared Hittite and Indo-Iranian view of the afterworld as a pasture, the Greeks referred to the afterworld, 'Hades of the famed foals' (*Áidi kluotopóloi*, Iliad 5.654), as a meadow (*leimón*): Thieme 1968c:144ff. Greek *Aídēs* 'Hades' is etymologized as **sm-wid-* 'meeting', in the sense of a meeting with one's ancestors (cf. the Sanskrit burial-hymn formula *pitṛbhiḥ sam-vidānā-* 'in order to meet with (one's) fathers': see Thieme 1968c).

9.3.4. Indo-European words for the afterworld

The Indo-European conception of the afterworld as a pasture or meadow where the souls of livestock and people grazed is confirmed not only by images from the individual traditions, but also by the fact that words for the world of the dead and the god of the dead are cognate and continue a Proto-Indo-European word **wel-* which originally meant 'pasture, meadow'.

PIE **wel-* 'pasture, meadow; dwelling of the dead' (and subsequently 'god of the dead', 'death'): Hitt. *wellu-* 'meadow; pasture of the dead', cf. Luw. *u(wa)lant-* 'dead' (see Hawkins 1980), Toch. A *walu* 'dead', *wāl-* 'die', *wlalune* 'death', Gk. *Elúsios leimón*, Hom. *Elúsiōn pedíōn* 'Elysian fields', 'fields of the dead' (for the etymology of *Elúsio-* from **wel-* see Puhvel 1969), Welsh *gweli*, Corn. *goly* 'wound', Oícel. *val-hqll* 'Valhalla' (dwelling place of warriors fallen in battle), *val-kyria* 'Valkyrie' (maiden who chooses a hero from the dead on the battlefield and conducts him to Odin and the world of the dead), Lith. *vėlinės* 'remembrance of the dead', Latv. *Veļu laiks* 'rite of remembrance for the dead', Lith. *Veliuonà* 'god of the dead' (see Ivanov and Toporov 1974), ORuss. *Veles* 'god of cattle' (Jakobson 1969, 1970).

52. The source of Pehl. *jamšēt*, *jamšīd* in the classical Persian epos; for a detailed account see Dumézil 1971:246ff.

9.3.5. Water as the boundary between the world of the living and the world of the dead

The 'pasture of the dead', where the souls of the dead go, is separated from the world of the living by water that must be crossed in order to enter the afterworld. An old man (PIE ***k̑***er(onth-), cf. Gk. *Khárōn*, OIcel. *karl*: see Lincoln 1980) conducts the souls of the dead to the afterworld. These ancient Indo-European conceptions can be reconstructed from linguistic evidence, from the earliest Indo-European rituals, and from corresponding motifs in the mythological traditions of the daughter languages.

In Sanskrit, the archaic god Varuna is connected with the cosmic ocean in the Rigveda (see Lüders 1951:I, 1959:II). In a hymn to Varuna (RV VII, 89), the singer asks not to be sent to the 'earth house' (*mṛnmāyaṃ gṛhām*), i.e. to the grave where ashes are put after cremation. The singer metaphorically presents himself as located 'in the middle of the waters' (*apām mādhye*).

The oldest image of transportation to the afterworld by boat is reflected in a Brahmanic formula: *naur ha vā eṣā svargyā yad agnihotram* 'the sacrifice to Agni (Agnihotra) is a ship (*naur*) which takes one to the sky' (*Śatapatha-Brāhmaṇa* 2, 3, 3, 15). According to the Upanishads, the deceased had to cross (verb *tṛ-*) first a lake, then a river.

The same mythological image is found in Greek tradition. In the Odyssey, Circe explains to Odysseus how to cross the ocean by boat and reach Hades, which 'none of the mortals on the black ship (*nēi*) had yet reached' (*eis Áidos d'ou pó tis aphíketo nēi melainēi*, 10.502). For a comparison of the Indo-Iranian and Greek conceptions see Thieme 1968c:150ff.

Interestingly, the very word ***nāu-s-** 'ship, boat' (see II.4.1.9.5n39), the vessel that transported souls to the afterworld (cf. Skt. *nāuḥ*, Gk. *nēūs*), could also acquire the secondary meaning 'death'. This occurs in a number of dialects: Goth. *naus* 'corpse', *ga-nawistrōn* 'bury' (etymologically 'send off by boat'), OIcel. *nár* 'corpse', OE *nē(o)-* 'corpse', ORuss. *nav* 'corpse', OCzech *nav* 'grave, netherworld, afterworld', Latv. *nāve* 'death', etc.

The same connection of water with death and the afterworld provides the basis for Proto-Indo-European rituals of 'water oaths' in Sanskrit and Greek tradition. The Sanskrit water oath of Varuna symbolizes the waters of death (Lüders 1951:I.28, 1959:II.667), which correspond to the waters of the river Styx which the Homeric gods swear by: *hórkou gār deinoû Stugòs húdatos* (Iliad 2.755) 'the waters of the Styx, awesome for oaths': see Thieme 1968c:150ff.

Especially interesting in this connection are the Hittite water oaths, which echo the Sanskrit and Greek ones in many respects: see Oettinger 1976:70-73.

9.3.6. Indo-European burial rites. The Old Hittite tradition of cremation

The burial rites of the ancient Indo-Europeans can be reconstructed in general outline by comparing the burial practices of the various early Indo-European traditions and establishing the shared features that may point to a common heritage. A general feature of most early Indo-European burial rites is the widespread (but not exclusive) practice of cremation followed by burial of the remains in special vessels.

For the ancient Hittite tradition numerous royal burial rites, performed both before and after cremation, are attested (Otten 1958). The deceased is carried out on a carriage to the cremation area, where an eternal fire burns: *nu ak-kán-za ku-e-da-aš uk-tu-[ri]-ya-aš wa-ra-a-ni...* (KUB XXX 15 Vs. 10) 'and into the eternal fire (*ukturi-*) in which the deceased (*akkánza*) is burned (*warani*)'.⁵³ For twelve days⁵⁴ after the cremation, various sacrifices are performed before the image of the deceased; the image is also carried away to the funeral pyre on a chariot (see II.6.6.9).

The second day after the cremation, women come to the eternal fire and collect the bones, quenching the fire with beer, wine, and the honey-based beverage *walḫi-*: *ma-a-an I.NA UD IIKAM lu-uk-kat-ta nu SALMEŠ uk-tu-[u-ri-y]a ḫa-aš-ti-aš le-eš-šu-u-wa-an-zi pa-a-an-zi na-aš-ta IZI IŠ.TU X DUG KAŠ X [DUG GEŠTIN] X DUG wa-al-ḫi ki-iš-ta-nu-wa-an-zi* 'at dawn of the second day, women go to the eternal fire to collect the bones (*ḫaštiyaš leššuwanzi*)⁵⁵ and then they quench the fire with ten jugs of beer, ten jugs of wine, and ten jugs of *walḫi-*' (KUB XXX 15 Vs. 1-2). The bones collected at the pyre are taken away and put in the 'stone house' É.NA₄, Hitt. *ḫaštiyaš pir*, É *ḫešta-*.

Archeological confirmation of cremation among the Hittites comes from finds of a number of burial urns with cremated ashes in two places in cliffs along the road to Yazılıkaya. A burial at Osmerkayaşı dated to the seventeenth to fourteenth centuries B.C. (Otten 1958:6) consisted primarily of cremations

53. Hitt. *war-* 'burn' (intrans.), cf. *warnu-* 'burn' (trans.), a Proto-Indo-European word cognate to Arm. *vařem* '(I) set fire', *vařim* '(I) burn' (intr.), OHG *warm* 'warm' (Ger. *warm*), Lith. *virti* 'boil' (intr.), OCS *variti* 'cook'.

Another Proto-Indo-European word meaning 'burn' (trans. or intr.) is **eus-*: Skt. *óṣati* 'is burning', ppl. *uṣtá-*, *uṣná-* 'hot', Hom. Gk. *heúō* (from **eusō*) '(I) burn, singe', Lat. *ūrō* '(I) burn, singe, destroy with fire', Olcel. *ysja* 'fire', *usti* 'burned', OE *ǣm-yrīe* (Engl. *ember*).

Another is **dhegho-*: Toch. A *tsāk-*, *tsak-*, B *tsāk-*, *tsek-* 'burn' (intr.), Skt. *dāhati*, Avest. *dažaiti* 'burns' (intr.), Gk. *téphra* 'ash', Alb. *djek* '(I) burn' (trans.), Lat. *foueō* '(I) heat, warm up', *fauilla* 'burning-hot ash', Mlr. *daig* 'fire', Lith. *degù* '(I) burn' (trans., intr.).

54. This may have some connection to the notion of the twelve body parts which in the Anatolian view made up the integral human body.

55. Hitt. *leš-* 'gather' is comparable to the Germanic-Baltic root **les-* 'gather, select', Goth. *lisan* 'gather, select', Olcel. *lesa* 'gather, select', OE *lesan*, OHG *lesan* (Ger. *lesen*), Lith. *lesù* 'collect, select, peck grain', Latv. *lasīt* 'gather, select'.

(50 out of 72 burials), which shows that cremation was widespread and not limited to the royal clan.

In addition to cremation, the Hittites apparently practiced inhumation as well. Hattusilis I (seventeenth century B.C.) in his will asks a woman to bury his body in the earth (Sommer and Falkenstein 1938).

9.3.7. Ancient Greek cremation

Both types of burial, cremation and inhumation, are found among the Mycenaean Greeks (Webster 1958:110). Cremation is rarer, found only at Knossos and Pylos, but ancient traces of cremation are found in Thessaly by the early Neolithic: see Gallēs 1975.

A striking parallel to the Hittite rite of cremation and collection of the bones by women is found in Homer. After the cremation of Patroclus's body, the fire is quenched with 'dark-red wine' (*aíthopi oínōi*). The relatives and friends of the deceased collect (*légōmen*)⁵⁶ the white bones (*ostéa leuká*), and put them in a golden vessel (*es khrusēēn phiálēn*) which they leave in a tent (*en klisíēsi dē théntes*) (Iliad 23.236-57). A similar rite lasting ten days is described for the cremation of Hector (24.788-95):

ἦμος δ' ἠριγένεια φάνη ῥοδοδάκτυλος ἠώς,
τῆμος ἄρ' ἀμφὶ πυρὴν κλυτοῦ Ἑκτορος ἤγρετο λαός.
αὐτὰρ ἐπεὶ ῥ' ἤγερθεν ὀμηγερέες τε γέροντο,
πρῶτον μὲν κατὰ πυρκαϊὴν σβέσαν αἶθοπι οἶνφ
πᾶσαν, ὅπόσσον ἐπέσχε πυρὸς μένος. αὐτὰρ ἔπειτα
ὀστέα λευκὰ λέγοντο κασίγνητοὶ θ' ἔταροί τε
μυρόμενοι, θαλερὸν δὲ κατεΐβετο δάκρυ παρειῶν.
καὶ τὰ γε χρυσεῖην ἐς λάρνακα θῆκαν ἐλόντες

'But when the young dawn showed again with her rosy fingers,
the people gathered around the pyre of illustrious Hektor.

But when all were gathered to one place and assembled together,
first with gleaming wine they put out the pyre that was burning,
all where the fury of the fire still was in force, and thereafter
the brothers and companions of Hektor gathered the white bones

56. Literally 'let us collect': Gk. *légō* '(I) gather, join', Lat. *legō* '(I) gather, select', Alb. *mb-ledh* 'collect; gather harvest', PIE **leḱ-*. In Germanic this root means 'cure, heal' (Pokorny 1959:658): Goth. *lēkeis*, Oícel. *læknir*, OE *læce*, OHG *lāchi* 'doctor, conjurer', *lāchin* 'treatment, cure' (the source of OCS *lěčiti* 'treat, cure', Vasmer 1953-II.27-28 [1964-1973:II.477]). The formal and semantic closeness of PIE **leḱ-* and **les-*, both 'collect, gather, select', is striking.

up, mourning, as the tears swelled and ran down their cheeks. Then they laid what they had gathered up in a golden casket'

Cf. also from the Odyssey *autàr epeì nekrós t' ekáē* (12.13) 'when the corpse was burned'.

9.3.8. The cremation rite in Sanskrit tradition

The funeral hymns of the Rigveda and Atharvaveda reveal burial rites that correspond to the Hittite and Homeric Greek rituals. The corpse was carried to the funeral pyre on a carriage, after which the first fire was lit and the corpse burned (RV X, 16, 1-8). Then a second fire was lit, where the god Agni, 'eater of sacrificial meat' (*Agní-kravyā́d-*, see Geib 1975) and 'carrier away of the sacrifice' (*kravyavā́hana-*, see M. Bloomfield 1924), burned the sacrifice which was brought to the gods (RV X, 16, 9-10). The bones remaining after the cremation were laid together in the form of a human figure, and dishes with ritual food were put beside the figure; cf. the Hittite rite involving the image of the deceased, to whom sacrifices were made after cremation. The bones were anointed with sesame oil mixed with barley and wrapped in a cloth 'made of grasses' (Atharvaveda XVIII, 4, 31); cf. the Homeric Greek ritual, where after cremation the bones were put in fat and wrapped in linen. Before the bones were buried a small house was erected on a pillar, and after the burial a grave-stone was set up; cf. the Hittite tent where the image of the deceased was brought, and the 'stone house' where the urn containing the bones was placed; likewise the Homeric tent for the bones of Patroclus, and the pit covered with stones for the bones of Hector.

The Sanskrit cremation purified the deceased with the aid of fire (*Agní-*); as a result his body parts merged with the elements originating in the corresponding organs of the mythical Purusha: *sū́ryam cákṣur gachatu vátam ā́tmā́* 'may the eye go to the sun, the ear to the wind' (RV X, 16, 3).

There is also archeological evidence for cremation in northwest India (see Stacul 1971).

For Old Iranian tradition there is evidence of a succession of various types of burials (see Humbach 1961, Benveniste 1962c). The Avesta reflects an ancient practice of cremation (*nasu-pāka-* 'corpse-burning', Bartholomae 1904:1059) and giving the corpse over to the earth (*zəmē ni-kan-*, Benveniste 1962c:39-43; see Perixanjan 1973:356, 501). In addition, the Iranians had a practice of leaving the dead in special 'houses of death', a custom preserved to modern times in some areas having Kafir and Dardic populations (see Jettmar 1966, Litvinskij 1972).

9.3.9. *Burial rites and cremation in Ancient Europe*

Customs of inhumation and cremation both existed in Rome; according to evidence from Pliny, cremation was considered an innovation (Dumézil 1966:75, 361-62).⁵⁷

According to ancient Germanic myth, a dead hero was burned on a pyre on a ship⁵⁸ together with his wife, retinue, and horse. The custom of cremation was established by Odin: the dead were to be burned together with those earthly goods that they could use in Valhalla, the afterworld (see de Vries 1957:II.374ff., Polomé 1970:77ff.). An ancient Germanic custom of cremating a dead warrior together with his horse is described by Tacitus and finds confirmation in archeological evidence (see Mogil'nikov 1974:180).

Cremation among the ancient Slavs is described by various medieval authors going back to the second half of the first millennium A.D. (the Polabian Slavs) and the beginning of the second (the eastern Slavs). The following picture of the rite can be established from these sources. The body of the deceased, accompanied by mourning, was brought to a communal fireplace, after which the relatives lit a fire. The next day the ashes and remains of the bones were collected and placed in an urn, which was buried in the ground or put on a stone, frequently by the side of the road (see Niederle [1956:206ff.]).

Similar information on cremation is provided by sources from the beginning of the second millennium A.D. for the Baltic tribes, Lithuanian (Mansikka 1921) and Prussian. Cremation was also known among the Gaulish tribes.

For Europe at the time of the spread of the tribes speaking Ancient European dialects, beginning in the late second and early first millennia B.C., two types of burial, cremation and inhumation, can be established from archeological evidence. Cremation succeeded inhumation, gradually spreading northward from the more southerly regions near the Danube, where it is attested since the beginning of the Bronze Age (see Nikitina 1974:8, fig. 2 et pass.). In the Ancient European cultures of this time, the cremated remains were buried in urns, usually ordinary domestic pottery but occasionally special models of houses. After cremation the bones were placed in the urn, sometimes in their correct anatomical order (see Mogil'nikov 1974:171). Often the urn was put into a stone box.

57. The Latin verb *sepelire*, cognate to Skt. *sápati* 'respects, performs rite, serves god', Gk. *hépō* '(I) serve, prepare' (PIE **sep-*, see Pokorny 1959:909), means 'bury, dig under' (of bones, *ossa*) and also 'burn' (trans.); cf. also Lat. *sepulcrum* 'grave, gravestone, deceased'.

We can also reconstruct details of a ritual for washing and clothing the deceased before burial. The deceased was dressed in clothing — Lat. **uespa* (cf. Hitt. *wašpa-* 'clothes', in an Old Hittite funeral song), the source of the Latin derivative *uespillō* 'corpse-bearer', which could refer to a thief who steals burial clothing (see Watkins 1969a).

58. Burial in boats is also attested among the ancient Slavs, and has been attributed to Germanic influence (Niederle 1956:210, fig. 7); see 9.3.5 above for the semantic equation of 'boat' and 'death' in Slavic and Germanic.

9.3.10. Two burial types among the ancient Indo-Europeans and conceptions of two types of death

The evidence concerning burial rites from various Indo-European traditions allows us to posit two basic types of burial among the ancient Indo-Europeans: cremation with subsequent burial of the cremated remains, and inhumation.⁵⁹ The choice of burial type could have been determined by social factors such as the rank of the deceased and possibly the age and sex, and probably also by the type of death. In this connection it is significant that the ancient Indo-Europeans distinguished two types of death. Traces of this distinction can be inferred from a reconstructed phrase meaning 'die one's own death', i.e. 'die a natural death': ***swo- mṛ̥thi-m mer-/mṛ-** (originally 'die the death of the ***swe-**', 'of one's own clan, ancestors'): OPers. *uvāmaršiyuš amariyatā* 'died his own death' (in the Behistun inscription this corresponds to the Akkadian phrase, unusual for that language, *mi-tu-tu ra-ma-ni-šu mi-i-ti* 'he died his own death': see Dandamaev 1962), Lith. *jis mirė sāvō mirtimi* 'he died his own death', Russ. *umeret' svojej smert'ju*⁶⁰ 'die one's own death'; cf. semantically identical combinations such as Lat. *fato suo mori* 'die by one's own fate' (Schulze 1933:135, Vasmer 1953-II.672 [1964-1973:III.686]) and possible Hittite parallels (see Puhvel 1969a).

9.3.11. The Proto-Indo-European nature of cremation and fire worship among the ancient Indo-Europeans

The cremation rite of the ancient Indo-Europeans, which required a technology fairly complex for its time, must have had a particular symbolic sense which distinguished it from the simpler inhumation. That symbolic sense was provided by the fire, ***ṇk'ni-**, which signified the purification of the deceased and the freeing of his or her soul to depart for a pasture or meadow in an afterworld separated from this world by water crossed by a boat or bridge.⁶¹ In some later Indo-European traditions, primarily ancient Indo-Iranian, fire as a symbol of purification became a basic object of worship.

59. Cremation presupposes a certain level of pyrotechnology if the required temperatures of 800° - 1000°C are to be reached (see Nikitina 1974:100). The claim that the Indo-Europeans practiced cremation is consistent with the conclusion reached above (II.6.5.7) that they had the technology required for pottery making and copper and bronze metallurgy.

60. Cf. the ancient Slavic custom of burying those who did not 'die their own death' (suicides, victims of drowning, children) differently from those who 'died their own death': their bodies were carried into the forest or disposed of in water (see Zelenin 1916).

61. Cf. the 'bridge to the afterworld' of Germanic myth, the 'fiery bridge' of Indic tradition, and analogous symbols in Roman tradition (Dumézil 1966:556-57) and elsewhere, including Slavic (Propp 1946).

The origin of cremation could have been connected with the hygienic measures which must be developed by primitive peoples, who are in constant danger of fatal infectious diseases and especially plague. For the peoples of the Old World — including the Hittites, as is shown by the well-known 'Prayer of Mursilis during a time of plague' (Goetze 1929) — plague (Hitt. *ḫenkan*) usually involved waves of epidemic caused by *Pasteurella pestis antiqua*. A geographical center of origin of the plague was in Egypt, and from there it was carried to the Hittites; it came to Egypt from the area of the great African lakes (see Le Roy Ladurie 1978:50-51). Burning not only the deceased but also his livestock and possessions, as is suggested by the cremation rites, could have been in origin a necessary defensive measure against the plague.

Chapter Ten

Reconstruction of Indo-European text fragments. Fragments of poetic speech; Indo-European metrical schemes. The counting system and number symbolism

10.1. Poetic text fragments involving myth and ritual

10.1.1. The reconstruction of fragments of speech longer than a word

By comparing cognate words, compounds, and phrases in various Indo-European dialects we can reconstruct for Proto-Indo-European not only the individual words and meanings formally and semantically analyzed above, but also whole phrases reflecting text fragments. Such fragments, which formed phraseological and semantic units, are preserved in a number of historical Indo-European dialects, making it possible to reconstruct them as Proto-Indo-European. This yields an understanding not only of individual Proto-Indo-European words but also of units larger than the word — phrases representing minimal text fragments.¹

1. Only in this sense can there be reconstruction of a verbal proto-text, that is, only when correspondences are observed among phrases found in related dialects which support reconstruction of a prototype in the protolanguage. Reconstruction of a proto-text by applying the rules for combining individual reconstructed words (as was done in Schleicher's well-known reconstruction of an Indo-European fable, and later by Hirt) does not yield an actual text of the protolanguage, but is simply an illustration of the rules for combining words, rules which reflect a certain amount of knowledge about the protolanguage.

On the other hand, a proto-text can be reconstructed on a purely semantic level, without formal expression, if uniform stereotyped formulas with varying content are observed among related dialects (see Meid 1978:8ff.). For instance, stereotyped spell formulas observed in Sanskrit and Germanic traditions (and elsewhere: see Kuhn 1968, Schlerath 1968, Toporov 1971) make it possible to reconstruct a sequence of semantic units but not the words that expressed them. An example is the following Sanskrit magical text, from the Atharvaveda, and its Germanic analogs (see de Vries 1957:II.169ff.):

Atharvaveda:

majjā majjñā sam dhīyatām

‘may marrow be joined with marrow’

carmanā carma rohātu

‘may joint be united with joint’

aṣṛk te asthi rohātu

‘may your blood and bones be covered’

Norwegian spell:

...lagde marv i marv

‘(he) put marrow together with marrow’

10.1.2. Some phrases from Indo-European poetic speech

The nature of the phrases thus reconstructed indicates that they had a special function and reflect parts of ritual-poetic or myth texts. This is shown primarily by their distinctive semantics and figurative poetics, which, taken together with their formal properties, provide grounds for assuming that ritual-poetic speech existed in ancient Indo-European society.

Examples of Indo-European ritual-poetic text fragments are phrases like the following:

PIE **nom(e/o)n d^heh-* 'establish a name, give a name': Hitt. *laman de-*, Hier. Luw. *adamain tuha* 'gave a name' (Karatepe), Skt. *nāma dhā-*, Avest. *nāmam dā-*, cf. Gk. *onomathētēs* 'name-giver' (in a mythological context in the Pythagoreans and Plato: *ho thémenos tà onómata* 'the one who gave names', about the name-giving hero of ancient myth), OCzech *dieti jmě* (Ivanov 1976a:45). This phrase, which dates back to Proto-Indo-European, shows that the ancient Indo-Europeans pondered about the origin of names for things. This is in fact reflected in individual Indo-European traditions in the form of a Vedic myth about wise men who established the names for things, and in a Greek myth about the first person, who gave names to things (see Tronskij 1936).

PIE **k^h(e/o)re/ot'- d^heh-* 'trust, believe', lit. 'put into (one's) heart': Hitt. *karatan dair* 'they put in a core, heart' (see II.9.1.2 above), Skt. *śrad-dhā-* 'entrust, believe', cf. the Avestan compound *zrazdā-* 'believe, entrust' (Benveniste 1969:I.171-79), Lat. *crēdō* '(I) believe', OIr. *cretim* '(I) believe'.

PIE **k^hlewo- d^heh-*, 'acquire glory, fame', lit. 'put glory (for oneself)': Skt. *śráva- dhā-* 'attain glory' (Rigveda I, 40, 4; 73, 7; 91, 18 et pass.), Gk. *kléos katathésthai* (Schmitt 1967:70, 71); cf. the Common Slavic compound name **Sŭ-dě-slavŭ* (ORuss. *Sdeslav*", Serbo-Cr. *Zdeslav*, Polish *Zdziesław*: see Tupikov 1903:408, Milewski 1969).

An even wider dialect distribution is shown by the compound represented in Skt. *urugāyām ... śrávo* 'wide glory', Hom. Gk. *kléos eurú*, and personal names: Skt. *Uruśravas-*, Celtic *Verucloetius* (mentioned in Caesar, *De bello Gallico* 1, 7, 3; see Schmitt 1967:72-75).

Indo-European **k^hlewo-* 'glory' is not represented in Anatolian, although the existence of a verb derived from it in Tocharian testifies to its antiquity: Toch. A, B *klāw-* 'designate, announce' (Van Windekens 1976:218). In light of

Merseburg spell:

bēn zi bēna,
bluot zi bluoda,
lid zi geliden,
sōse gelīmida sīn!

'bone to bone,
blood to blood,
member to member,
may they be joined'

These texts permit us to reconstruct a similar spell for Proto-Indo-European; however, the historically attested variants permit reconstruction only of the general pattern of the original, and not of its form.

what is known about Indo-European dialect differentiation, an attestation in Tocharian and elsewhere in Indo-European, even without an Anatolian cognate, testifies to a Proto-Indo-European date. Note the striking formal coincidence of Toch. A *ñom-klyu*, B *ñem-kälywe* 'fame', Skt. *śrútyaṃ nāma*, Gk. *ónoma klutós > onomáklutos* 'illustrious in name' (Schmitt 1967:91).

It is interesting that the motif of fame and glory is one of the favorite ones in Indo-European poetic speech.²

Other phrases containing **k̑hlewō-* are dialectally more restricted, represented primarily in the Greek-Aryan area: Skt. *śrávo ákṣitam* 'unfading glory', Hom. Gk. *kléos áphthiton* (Iliad 9.413) 'everlasting glory'. There are other corresponding phrases involving the same epithet: Skt. *útsam ákṣitam* 'never-drying source of waters', Gk. *áphthiton húdōr*; Skt. *śrávo amṛtam ajuryám* 'ageless immortal fame', Gk. *kléos agératon* 'ageless glory': Schmitt 1967:69-70, Nagy 1974a.

A significant number of ritual-poetic phrases are restricted to the Greek-Indo-Iranian dialect area. In general, in addition to its other common features the Greek-Indo-Iranian area shows striking sharings in phrases reflecting fragments of ritual-poetic speech: e.g. Skt. *iṣiréṇa mānasā* 'fierce in sacred spirit', Hom. Gk. *hieròn ménos* 'sacred strength' (Odyssey 18.34, used of Antinoos) (Schmitt 1967:111-14); Skt. *sūrya- ... spás-* 'the sun ... which watches', Hom. Gk. *Éélion ... skopón*; Skt. *svādór mádhvah* 'of sweet honey', Gk. *méthu hēdú* 'sweet honey'; Skt. *uśasaṃ vibhātīm* 'shining dawn', Hom. Gk. *phaesímbrotos ēōs* 'shining dawn'; and others. For further examples see Schmitt 1967:111ff.

10.1.3. Metalinguistic designations for poetic speech

The existence of a special ritual poetic speech in Proto-Indo-European culture is also evident from the special terms referring to this type of speech in contrast to others. One such is **sHomen-* 'song, singing': Hitt. *išḫamai-* 'song', *išḫamai-* 'sing', *išḫamatalla-* 'singer', Skt. *sāman-* 'song, singing'. Another is PIE **wek̑hō-* 'talk, compose, praise': Toch. A *wak*, B *wek* 'voice', *wesk-* 'talk', Toch. A *wāktasurñe* 'praising, eulogy', Skt. *vākti, vívakti* 'talks, prophesies', *vācaḥ* 'word, speech', *vāk* 'goddess of speech' (in the Rígvēda), Avest. *vak-* 'talk', *vačah-* 'word, speech', *vāxš* 'word, speech', Arm. *gočem* '(I) call, cry', Gk. (w) *épos* 'speech, epic song, tale, story', *épea pteróenta* 'winged words' (Odyssey 1.122; see Durante 1968 [1958]), *Kalliópē*, muse of epic poetry (etymologically 'beautiful-voiced'), Lat. *uōx* 'voice', *uocō* '(I) call', *inuocatiō* 'invocation', OIr. *foccul* 'word'; cf. OIr. *anocht* 'error' (departure from the

2. It can be assumed that such fame was obtained by a man who distinguished himself in military exploits and the art of war; this is consistent with the view of the ancient Indo-Europeans as warlike tribes.

poetic canon), beside Skt. *anukṭā-* 'unsaid, unsayable' (Watkins 1970); also OHG *giwahanen* 'recall', *giwaht* 'glory, recollection', OIcel. *vátta* 'talk, recall, remind' (< Gmc. **wahta-*), *vátt* 'testimony', *ómun* 'voice'.

A characteristic feature of Indo-European metalinguistic terms for poetic speech is the metaphorical use of handcraft terminology to describe poetic art: **thēkhs-* 'prepare, weave, work (material), mold' in the meaning 'compose (a poem)' (Skt. *takṣ-* 'compose a poem', RV I, 130, 6; III, 38, 1 et pass.; Hom. Gk. *tékhnē* 'art', etc.); **seH(i)-* 'knit, twist' used to mean 'song, singing' (the original meaning evidently was 'something woven, joined, put together'): Hitt. *išḫamai-* 'sing', *išḫamai-* 'song', Skt. *sāman-* 'song, Vedic poem'; **syu(H)-* 'knit, sew, twist' meaning 'connected poetic text; work of art' (cf. Skt. *sūtram* 'sutra, text, work of art') and others (for these terms in their original meanings pertaining to crafts, see II.6.5).

It can be assumed that a widespread device in Indo-European poetic speech was the *figura etymologica*, use of a verb together with a deverbal noun from that same verb, as in Skt. *vacas-* *vac-* 'utter a word', Hom. Gk. *épos eipēin* 'utter a word' (Schmitt 1967:264-65); there are analogous figures in Hittite: *ḫaneššar ḫannai-* 'judge a case', *kupiyattin kup-* 'make a plan' (lit. 'plan a plan').

It appears possible to reconstruct for Indo-European a word **wāth-* which referred to the state of emotional arousal, ecstasy, or inspiration involved with the process of poetic creation: Skt. *api-vat-* 'inspire' (e.g. *ápi vātaya mánah* 'inspire in thought',³ RV X, 20, 1), Thieme 1968d; Avest. *api-vatāite* 'inspires', Lat. *uātēs* 'prophet, seer, soothsayer, inspired singer, poet', e.g. *uātēs Maeonius* 'Homer', OIr. *fáith* 'prophet, soothsayer, poet' (see Meid 1974:32), Welsh *gwawd* 'poem', Goth. *wōds* 'possessed, obsessed', OIcel. *óðr*, OE *wōd*, OHG *wuot* (Ger. *Wut*) 'madness, frenzy'; OE *wēdan*, OHG *wuoten* (Ger. *wüten*) 'be violent, possessed'; cf. OIcel. *Óðinn*, OE *Wōden*, OHG *Wuotan*, the ancient Germanic god (Odin) of poetic inspiration (Höfler 1974), OIcel. *óðr* 'poetry', OE *wōð* 'song, voice, poem', OCS *věti(ji)* 'orator' (Toporov 1958:86-88, Pohl 1977:17, Meid 1978:17).

Another Proto-Indo-European word having to do with poetic creativity may have been **khe/ou-* 'foresee, perceive, know':⁴ Skt. *kaví-* 'wise, wise man,

3. Skt. *mānas-* 'thought, spirit' shows correspondences to Hom. Gk. *ménos* 'inclination, urge, anger, life force', Toch. A *mnu* 'spirit, wish', B *mañu* 'wish' (Van Windekens 1976:301), Lat. *mēns* 'mind, anger, thought' and is related to the verb of speech derived from the same root (Hitt. *mema-* 'talk', OCS *mĭnjo* '(I) say') and verbs of mental activity (Skt. *mānati* 'mention') such as Hom. Gk. *mémōna* (perf.) '(I) think, decide', *mimnēskō* '(I) remember', Lat. *memini* '(I) remember'. This points to an Indo-European word **men-* with the general meaning of mental activity: 'think, remember, talk'.

4. The more general meaning 'know, perceive' was evidently conveyed by the verb **w(o)it-*: Skt. *vēda* '(I) know', Gk. *oída* '(I) know', OE *wita* 'wise man', *witan* 'know', OCS *vědě* '(I) know', with zero-grade derivatives meaning 'see': Lat. *uideō* '(I) see'; cf. also derivatives in **-men-*: Skt. *vidmán-* 'knowledge', Gk. *ídmon* 'having knowledge of', Toch. A, B *ime* 'memory, awareness' (Van Windekens 1976:184).

seer, poet' (cf. *kavyātā* 'wisdom'), Avest. *kavay-* 'leader', Lyd. *kaveś* 'priest, poet' beside Gk. *kūdos* 'glory, honor', OCS *čudo* 'miracle, wonder', *čujq* '(I) perceive'; cf. the later derived meaning of Gk. *akoúō* '(I) hear', Lat. *caueō* '(I) am careful, wary, on my guard', Goth. *hausjan*, OE *hieran* (Engl. *hear*), OHG *hōr(r)en* (Ger. *hören*) 'hear'.

The special standing of the singer and poet, who was considered a seer, prophet, and soothsayer, gave him status equal to that of the priest or religious leader, who created a connection between earth and sky. This may account for the fact that some Indo-European ritual technical terms having to do with cults acquire the meaning 'poet' in some traditions. For instance, **wel-* 'underworld, afterworld' and other meanings having to do with the cult of the afterworld (Oícel. *Valkyria* 'Valkyrie, maiden who leads a slain warrior to the afterworld', *Valholl* 'Valhalla, home of slain warriors'; see II.9.3.4) is the root of the Celtic word for a professional court poet: OIr. *fili* (see Watkins 1963:214, Meid 1974:24), cf. ORuss. *Velesov* "v"nuk" 'grandson of [god] Veles', used of the poet Bajan (Jakobson 1969); cf. also Mlr. *creth* 'poetry', Welsh *prydydd* 'poet' beside Lith. *kerai* (pl.) 'sorcery, witchcraft', OCS *čarodějī* 'magician, sorcerer' (Watkins 1963, Ward 1973:140).

In the views of the ancient Indo-Europeans, reflected with particular clarity in the Indo-Iranian tradition, poetry was regarded as an expression of divine thought which was put into the heart of the poet (cf. **k̑hret'-dheH-* 'put into the heart', discussed above), who in turn conveyed it to others in phrases created by him: see Schlerath 1974:220.

The existence of Proto-Indo-European words for musical instruments would indicate that ritual singing was usually done with musical accompaniment. One such word is **gholghol-*. Hitt. *galgalturi-* 'cymbals' or a particular type of percussion instrument (Gurney 1977:35) and its cognates Skt. *gárgara-* 'musical instrument' (*áva svarāti gárgaro* 'the musical instrument sounds', RV VIII, 69, 9) and Common Slavic **golgolŭ* 'word, speech, sound' (Trubačev 1979:6.205) are grounds for reconstructing the Proto-Indo-European reduplicated stem **gholghol-*, possibly onomatopoeic, which referred to some musical instrument.

10.2. The sound structure of Indo-European poetic speech

10.2.1. Phonetic repetition, alliteration, anagrams

That several of the reconstructed poetic phrases did in fact belong to poetic speech is shown by their phonetic characteristics. Phonetic repetition has the effect of joining such phrases into a single whole. Examples of such phrases are **ghoen- *nghoim* 'kill serpent' (Skt. *áhann áhim* 'killed the dragon', RV I, 32,

1, 2 et pass.); *bhergh- *Hek'or- 'high mountain', *ekhu- *ekhwo- 'fast horse' (Skt. *āsúm ás'vam* (acc.), or the compound *ās'vāśva-* 'having fast horses', Avest. *āsu.aspəm* 'having fast horses', Hom. Gk. *ōkéēs híppoi* 'fast horses': see Schmitt 1967:238-42).

This Proto-Indo-European principle of alliteration, found in reconstructed fragments of poetic speech, continues to be used in the poetic traditions of the individual historical dialects. In Hittite fragments of poetic speech it is already possible to detect a tendency toward alliteration, e.g. three instances of (-)pi- in a hymn to the god Pirwa (alliterating segments are boldfaced):

ašši mekki aššu piyaweni

LUGAL-i **D**Pirwaš *ḫapinaḫzi*

'And we bring him much bounty,

The god Pirwa gives to the king' (Laroche 1965c:114)

In the archaic Armenian hymn preserved in Moses of Chorene (see Dumézil 1969) alliteration is a basic means of artistic expression:

erknēr erkin ew erkir

erknēr ew cirani cov

'Heaven and earth were in labor,

And the purple sea was in labor'

Alliteration is also one of the basic structural devices in Sanskrit poetry. Alliterative repetition has the semantic function of singling out a syllable or phoneme group of some key word that carries the major semantic load within the relevant poetic segment. In a hymn to the goddess of speech Vak, the alliterating syllable *va-* is part of the name of the goddess, who is the semantic center of the hymn even though she is not directly named in it. Alliteration is thus a means for latent naming of the goddess:

ahám evá vāta iva prá vāmy ārabhamāṇā bhúvanāni víśvā

paró divā pará enā pṛthivyáitávatī mahinā sám babhūva

'I breathe like the wind, supporting all the worlds. Beyond the sky,
beyond this earth — so great have I become by my might'

(RV X, 125, 8; see Toporov 1965;

English translation from Brown 1978:51)

This principle of alliteration and paronomasia, based on a syllable or sound complex of a semantically central word, was also used in Greek⁵ and early

5. This principle is widely used in Homer, e.g.:

órsas argaléōn anémōn amégarton aūtmèn

'having raised a stormy squall of strong winds' (Odyssey 11.400)

where the alliterating *ga* echoes the name Agamemnon, mentioned two lines earlier (Saussure [1977:645]).

Latin⁶ poetry and can thus be regarded as an artistic device characterizing Proto-Indo-European poetry. Saussure (1964:111ff.) called such devices *anagrams* and traced them to the Proto-Indo-European poetic tradition (see Starobinski 1971).⁷

In Germanic poetry, the Proto-Indo-European semantic principle of alliteration changed into a purely formal feature, the obligatory phonetic repetition of initial stressed syllables. A system thus arose where the number of alliterative syllables was determined by the number of stressed syllables with no reference to their semantics. Unstressed words did not alliterate. This was a sort of internal rhyme of initial consonants which linked all stressed syllables of the line by phonetic similarity (see Lehmann 1956, Pope 1966:247ff.). An example from *Beowulf* (alliterating segments boldfaced):

Stræt wæs stānfāh, stīg wīsoðe
gumum ætgædere. Gūðbyrne scān
heard hƿondlocen, hringīren scīr
song in searwum... (320-24)

'The road was paved with stones, the path led
the warriors together, the war armor shone,
hard, with hand-forged links. The iron of the rings
sang loudly in the armor'

10.2.2. Reconstruction of archaic Indo-European metrical patterns. Indo-European metrics in typological perspective

Since we have fragments of poetic speech going back to the Proto-Indo-European period, we can raise the question of Proto-Indo-European verse metrics. Since the poetic fragments that have been reconstructed are less than a line in length, the meter can be established only by comparing the most archaic meters found in various Indo-European poetic traditions and tracing them to their common metrical pattern.

6. This is especially clear in the so-called Saturnian poetry, which is still free of Greek influence (Cole 1969). In a hymn to Mars, alliteration is based on the repetition of initial *m* (see West 1973):

<i>ego tui memini.</i>	'I call on you,
<i>medere meis pedibus.</i>	come to the aid of my feet;
<i>terra pestem teneto.</i>	may the earth take away diseases;
<i>salus hic maneto</i>	may health remain here,
<i>in meis pedibus</i>	in my feet'

7. Alliterative repetition in poetry, where words are broken down into syntagmatic sequences based on maximal phonetic similarity of the *signifiants*, shows a tendency toward strengthening the motivatedness of signs on the level of horizontal relations (see Gamkrelidze 1974). Semantically related *signifiés* in the poem tend to be expressed by means of phonetically similar *signifiants*.

The most archaic meters in the Indo-European traditions are characterized by a constant number of syllables in the line. The minimal line consists of seven or eight syllables with a caesura dividing it into 5 + 3 syllables, 4 + 4, or 4 + 3. The line end is characterized by a particular relationship of short and long syllables, with the penultimate syllable usually short and the antepenultimate syllable long.

This rhythmic pattern is found in Hittite verse, particularly funeral hymns, e.g. (2 BoTu 14 I 13ff.):

1. <i>Nešaš wašpaš, Nešaš wašpaš</i>	‘Clothes of Nesas, clothes of Nesas,
2. <i>tiya-mmu tiya</i>	Put on me, put on;
3. <i>nu-mmu annaš-maš katta_arnut</i>	Bring down to me my mother’s,
4. <i>tiya-mmu tiya</i>	Put on me, put on;
5. <i>nu-mmu uwaš-maš katta_arnut</i>	Bring down to me my forefather’s,
6. <i>tiya-mmu tiya</i>	Put on me, put on’
(see Watkins 1969a)	

Lines 1, 3, and 5 consist of eight syllables, the first one 4 + 4 and lines 3 and 5 both 5 + 3.⁸

An analogous pattern is characteristic of the verses pronounced during a royal burial rite (KUB XXX 27 Rs. 1-2):

<i>kuit-wa-šši kuit eššaweni</i>	8: 3 + 5
<i>nu-war-at-ši ara ešdu</i>	8: 4 + 4
‘Whatever has been done to him, may all that be to his good’	
(see Otten 1958:98-99)	

A similar verse structure is still visible in late Anatolian, in Lydian:

<i>sarokak ... nikumēk savēnt</i>	8: 3 + 5
‘... but never more to flourish (?)’	(see Miller 1968:220)

The Rigveda shows identical metrical patterns: an eight-syllable line divided by a caesura into 4 + 4, 3 + 5, or 5 + 3:

<i>agnīm iḷe puróhitam</i>	8: 4 + 4
<i>yajñásya devám ṛtvíjam</i>	8: 3 + 5 or 5 + 3
<i>hótāram ratnadhātāmam</i>	8: 3 + 5
‘I call on Agni as plenipotentiary, as god of sacrifice and priest, as bringer of sacrifice, bringing the greatest treasures’ (RV I, 1)	

Archaic Greek verse found in Mycenaean texts follows the same pattern:

8. The phrase *katta arnut*, with identical abutting vowels, should evidently be read with elision of one of the vowels: *katt’ arnut*.

to-ko-do-mo de-me-o-te 8: 4 + 4
toikhodómoi demeóntes
 'carpenters (who are) building' (Webster 1955, Kuryłowicz 1956:283)

The early Latin Saturnian verse, originally using an eight-syllable line of 4 + 4 (see Cole 1969:69, 174) and later a seven-syllable, 4 + 3 or 3 + 4 line, is close to Greek paroemiac verse.

nouom uetus uinum bibo 8: 4 + 4
 'old, I drink new wine'

pastores te inuenerunt 8: 4 + 4
 'shepherds found you'

ego tui memini 7: 4 + 3
 'I keep you in mind'

The most archaic forms of Slavic verse have an eight-syllable line of 3 + 5 or 5 + 3 and 4 + 4 (Jakobson 1966:448), e.g. from a Serbian epic:

Što se Janko ne oženi 8: 4 + 4
 'That Janko won't get married'

In Russian folk poetry, eight-syllable lines of 5 + 3, 3 + 5, and 4 + 4 characterize the language of historical songs, beginning with the earliest verses from the Russian Primary Chronicle (PSRL I:12):

Pogiboša aki obrě 8: 4 + 4
 'They perished like the Avars'

From a song about Ivan the Terrible (Jakobson 1966:447):

Ne-u-nas vo-svjatoj Rusi 8: 3 + 5
 'Not in our holy Russia'

Analogous meters are found in West Slavic historical songs and can be reconstructed for Common Slavic (Jakobson 1966; cf. Watkins 1963).

In Lithuanian folk songs we find, in addition to other line lengths, an extremely archaic type composed of eight syllables with an internal division into 4 + 4 or 3 + 5, e.g. in a song about the moon, the sun, and Perkunas:

Saulužė anksti kėlės, 8: 4 + 4
Mėnužis atsiskyrė 7: 3 + 4
Mėnuo viens vaikštinėjo 8: 4 + 4
 'The sun came up early,
 parted with the moon,
 the moon went walking alone'

In a number of these early Indo-European metrical traditions we also find more complex meters arising from the combination of original eight-syllable or seven-syllable lines. For instance, the archaic 16-syllable line of Slavic wedding and calendar songs arises from the doubling of eight-syllable lines (Zemcovskij 1975:163-64). The combination of eight-syllable sections (*ladas*) into 16-syllable verses in the Vedas is essentially analogous, as is also true of Greek (see West 1973, Nagy 1974a).

In addition to combining two eight-syllable lines into a 16-syllable line, it was also possible to combine two half-lines to produce a ten- or nine-syllable line with a caesura: 5 + 5 or 5 + 4. These combined meters are attested in Sanskrit poetry, and in archaic Greek, Slavic, and other ancient Indo-European verse patterns (for combined meters see Meillet 1923, Jakobson 1966, Watkins 1963, Nagy 1974a).

A striking parallel to the Indo-European versification system and caesura structure of 4 + 4 or 3 + 5, 5 + 3 is displayed by Kartvelian syllabic verse, which uses a 16-syllable line composed of two eight-syllable parts each divided into 4 + 4 or 3 + 5 or 5 + 3. This Proto-Kartvelian system, represented in the classical Georgian verse of Rustaveli, is typologically isomorphic to reconstructed archaic Indo-European verse (see Cereteli 1973, 1974).

10.3. Numbers and the counting system

10.3.1. *Principles for reconstructing the numerical system. A base-ten counting system in Indo-European*

The ancient Indo-European counting system can be reconstructed from the numerical systems attested in the historical Indo-European dialects. Cognate numerals provide the evidence for reconstructing their Indo-European protoforms and positing a base-ten counting system for the Indo-European community. This system is reflected without essential alteration in the individual historical Indo-European traditions.

10.3.2. *The numerals 'one' and 'first', and their typology*

No single basic Proto-Indo-European word for 'one' can be reconstructed. The following stems are found in the meaning 'one' in the various dialects:

***se/om-:** Hitt. *šanna-* 'once, one', Toch. A *sas* (masc.), *sām* (fem.), B *še* (masc.), *sana, somo* (fem.), Hom. Gk. *heīs* 'one' (from **sems*), fem. *mía* (from **smia*), neut. *hén*, cf. Lat. *semel* 'once, one time'. The word is evidently of pronominal origin, and its use in the meaning 'one', 'forming a unit' (Anttila

1972:366-67)⁹ is the result of relatively recent development in the individual Indo-European dialects. The adjectival and pronominal origin of the word is still visible in forms etymologically related to it such as Skt. *samá-* 'even, alike, same', Avest. *hāma-*, OPers. *hama-* 'equal, same', Gk. *homós* 'common, identical', *homoû* 'together', OIr. *-som* '(him)self', OCS *samŭ* 'himself, by himself, alone', cf. ORuss. *sam" drug"* 'one with another' (lit. 'himself other'), *sam" pjat"* 'fifth in a series' (lit. 'himself fifth') (see Suprun 1969:7), Goth. *sama* 'same', OE *same* (Engl. *same*).

Related to this root is **sēm-* with a different vowel grade, used in compounds: **sēm-i-*¹⁰ 'half' (i.e. an equal part of a whole): Skt. *sāmī-*, Gk. *hēmi-*, Lat. *sēmi-*, OHG *sāmi-* (*sāmi-queck* 'half alive', Gk. *hēmíbios*).

Another stem meaning 'one' (in counting: see Anttila 1972:366-67) in some dialects is **oi-*, which takes various suffixes:

**oi-no-*: OLat. *oino-*, Lat. *ūnus* 'one', OIr. *óen*, Gk. *oiné* 'one' (on dice), Goth. *ains*, OHG *ein* (Ger. *eins*), OE *ān* (Engl. *one*), OPruss. *ains*, OCS *inŭ* in *jed-inŭ* 'one' (beside *inŭ* 'other').

**oi-kh-*: Mitannian Aryan *aika-*, Skt. *éka-*, cf. Lat. *ūnicus* 'only, unique', Goth. *ainaha*, OHG *einac* (Ger. *einig*) 'a, some, separate', OE *ænig* (Engl. *any*), OCS *inokŭ* 'hermit', lit. 'alone, single'.

**oi-wo-*: OPers. *aiva-*, Avest. *aēva-*, cf. Gk. *oíos* 'only, single', Skt. *evám* 'so, only'.

The ordinal 'first' is suppletive, formed from the base **ph(e)ṛ-H-* plus various suffixes in the individual dialects:

**phṛ-H-wo-*: Toch. B *pārweṣṣe* 'first', Skt. *pūrva-*, Avest. *paurva-* 'former, first', Alb. *pārē* 'first', OCS *prŭvŭ* 'first'.

**phṛ-H-mo-*: OE *forma* 'first' (Engl. *former*), OSax. *formo*, OPruss. *pirmas*, Lith. *pirmas*.

**phṛ-is-mo-*: Lat. *prīmus* 'first' (cf. Lat. *prīuus* 'only, single' < **phrei-wo-*).

**phṛ-is-tho-*: OHG *furisto* 'first, highest' (cf. Ger. *Fürst* 'prince'), OE *fyrst* (Engl. *first*).

The absence of a special numeral 'one' is found in other protolanguages as well. In Semitic, 'one' is expressed by different words: Akkad. *ištēn*, Arab. *wāhid-*, 'aḥad-, fem. 'iḥdā, Hebr. 'eḥād, fem. 'aḥaṭ. An analogous situation is reconstructed for Proto-Kartvelian, cf. Geo. *ert-*, Mingr.-Laz *art-* 'one' beside Svan *ešxu* 'one'. The Svan form goes back to an adjectival formation **šxwa-*

9. Sihler 1973 assumes that the word may be an ancient term for 'pair'.

10. In compounds, any adjectival suffix could be replaced by **-i-*, which was a link element between the adjective and the next word: e.g. Avest. *bərəzi-čaxra-* 'high-forested' beside *bərəzant-* 'high', Gk. *kudi-áneira* 'glorifier of husbands': see Meillet 1937 [1938:297]. The same explanation accounts for the suffix **-i-* of **t'w-i-* 'two' in **t'w-i-phē/ot-* 'two-footed', **t'w-i-t'kḥmth-* 'two tens', etc.

'other', cf. Geo. *sxva*- 'other', Mingr. *šxva*- 'other' (Klimov 1964:178-79); for the semantics cf. Slavic *inŭ* 'one; other', above.

The lack of a special word for 'one' in the numerical system can also be illustrated from many ancient languages, in which, although numerals for two to ten are attested, no word for 'one' is known. For example, in Sumerian 'one' is expressed by various words of nominal origin: *deš*, *dili*, *aš*, *gè*, possibly with the original meaning 'man, person' (see Riftin 1927:183-84, Diakonoff 1967:60). For Hurrian no special word for 'one' is found (Diakonoff 1967:141, 1971:106).¹¹

The lack of a special numeral 'one' in the counting systems of these languages becomes understandable if we consider counting from a typological perspective. Counting or enumeration of objects per se begins with two or more, while 'one' is not counting but simply naming the object by means of its special designation. Subsequently, such names become specialized words meaning 'one' and enter the numeral series as the first numeral. This is the cause of the disparity in words for 'one' among related dialects.

10.3.3. Numerals of the first decade

From 'two' on, the numerals in the Indo-European dialects show strict phonemic correspondences which make it possible to reconstruct a complete system of Indo-European numerals:

PIE ***t'wo**- (earlier ***t'oo**-, see I.2.4.6 above) 'two'; ***t'w-i**- (in compounds): Hitt. *da*- (in *dayuga*- 'two-year-old'), *dan* 'second', Toch. A *wu* (masc.), *we* (fem.), B *wi* 'two', Skt. *dváu* (dual), *dvā* (masc.), *dvē* (fem., neut.), *dvi*- in compounds (e.g. *dvi-pād*- 'two-legged'), Avest. *dva* (masc.), *baē* (fem.), *bi*- in compounds (*bi-māhya*- 'two-month'), Arm. *erku*, *erki*- in compounds (*erke-am* 'two-year-old'), Hom. Gk. *dú(w)o*, *dúō*, *di*- in compounds (*dí-pous* 'two-legged'), Alb. *dy*, Lat. *duo*, OLat. *dui*-, Lat. *bi*- in compounds (OLat. *dui-dēns*, Lat. *bidēns* 'type of hoe', 'sacrificial animal with both rows of teeth intact'; orig. 'two-toothed'), OIr. *dáu*, *dó*, fem. *dí*, Goth. *twai* (masc.), *twōs* (fem.), *twa* (neut.), OIcel. *tveir* (masc.), *tvær* (fem.), *tvau* (neut.), OE *tū* (masc.), *twā* (fem.) (Engl. *two*), in compounds *twi*- (*twi-fēte* 'two-footed'), OHG *zwēne* (masc.), *zwā*, *zwō* (fem.), *zwei* (neut.), in compounds *zwi*- (*zwi-houbit* 'two-headed') (Ger. *zwei*), Lith. *dù* (masc.), *dvi* (fem.), *dvi*- in

11. Urartean has a form *šusini* described as meaning 'one' or 'united, indivisible': *šusini šale* 'in one year'; the locative case of this word is attested as well (Melikišvili 1960:65, 408). However, the word is used in contexts such as *šú-si-na* MUMES (UKN 264, 28) = Akkad. *i-na lib-bi ša-na-te* MUMES 'during the course of (lit. 'in the midst of') [many] years', which rather suggests that the meaning was not that of the numeral 'one'. In that case *šú-si-ni* MU *za-du-ú-bi* (UKN 127, 224, 319, 45, etc.) should be understood not as '(he) finished it (in) one year' but rather '(he) finished it within (a) year'.

compounding (*dvigubas* 'double'), OPruss. *dwai*, *dvi-* in compounding (*dwigubbus* 'double, special'), OCS *dŭva* (masc.), *dŭvě* (fem.). PIE *t'wis 'twice': Skt. *dvīh*, Avest. *biš*, Gk. *dís*, OLat. *duis*, Lat. *bis*, MHG *zwir*.

PIE ***threi-** 'three', in compounds ***thri-**: Hitt. *teriyanna-* 'third, for the third time', *teriyalla-* (*tariyalla-*) 'beverage' (Sumerogram III-*yalla-*); Toch. A *tre* (masc.), *tri* (fem.), B *trey*, *traí* (masc.), *tarya* (fem.), in compounds *tri-* (*tri-wsālum* 'having three garments'); Skt. *tráyaḥ* (masc.), *tisrá-* (fem., with dissimilative loss of the first *-r-*), *trīṇi* (neut.), *tri-* in compounds (*tri-pád-* 'three-footed'); Avest. *θrayō* (masc.), *tišrō* (fem.), *θri* (neut.), in compounds *θri-* (*θri-kamərada-* 'three-headed'); Arm. *erek'*; Gk. *treís*, in compounds *tri-* (*trí-pous* 'tripod'); Alb. *tre* (masc.), *tri* (fem.); Lat. *trēs*, in compounds *tri-* (*tri-pēs* 'three-footed'; for Latin compounds with *tri-* see Risch 1976:886-87); OIr. *tri* (masc.), *téoir* (fem.); Goth. *þreis*, neut. *þrija*, OE *þrīe* (masc.), *þrēo* (fem.) (Engl. *three*), OHG *drī* (Ger. *drei*), OPruss. *tris*, Lith. *trỹs*, Latv. *trīs*, OCS *trije* (masc.), *tri* (fem., neut.). PIE ***thris** 'three times': Skt. *trīh*, Avest. *θriš*, Gk. *trís*, OLat. *terr*.

PIE ***khoethwe/or-** 'four', ordinal *(**kho**)**thur-yo-**, ***khoethur-tho-** 'fourth': Toch. A *štwar*, B *štwer*, *šwer*, Skt. *catvāraḥ* (masc.), *cátasraḥ* (fem.), with dissimilative loss of the first *-r-*; *catvāri* (neut.); Avest. *čaθwārō* (masc.), Pers. *čahār*, Arm. *č'ork'*, Myc. Gk. *qe-to-ro*, Hom. *téssares*, Lat. *quattuor*, OIr. *ceth(a)ir*, fem. *cethéoir*, Goth. *fidwōr*, OE *fēower* (Engl. *four*), OHG *fior*, *feor* (Ger. *vier*), Lith. *keturi*, Latv. *četri*, OCS *četyre* (masc.), *četyri* (fem., neut.).¹² Toch. A *štärt*, B *štarte* 'fourth', Skt. *caturthá-*, *turīya-*, *túrya-*, Avest. *türya-*, Arm. *č'orir*, *č'orr-ord*, Hom. Gk. *tétratos*, Lat. *quārtus*, OIr. *cethramad*, OHG *fiordo*, OE *fēorða*, OIcel. *fjórði*, Lith. *ketviřtas*, OCS *četrvřtŭ* 'fourth'.

PIE ***phenkhoe** 'five', ordinal ***phenkho-tho-** 'fifth': Hier. Luw. *panta*, Toch. A *pāñ*, B *piš*, Skt. *pāñca*, Avest. *panča*, Arm. *hing*, Gk. *pénte*, Alb. *pēsē* (Geg *pēsē*), Lat. *quīnque*, OIr. *cóic*, OWelsh *pimp*, Goth. *fimf*, OIcel. *fimm*, OHG *fimf*, *finf* (Ger. *fünf*), OE *fif* (Engl. *five*), Lith. *penki*, OCS *petŭ*. Toch. A *pānt*, B *pinkte* 'fifth', Skt. *pakthá-*, Avest. *puxda-*, Gk. *pémptos*, Lat. *quīntus*, Goth. *fimfta-*, OHG *fimfto*, *finfto*, OIcel. *fin(m)ti*, Lith. *peñktas*, OCS *petŭ*.

PIE ***šoeķhs-** 'six', ordinal ***šoeķh-tho-** 'sixth': Toch. A *šāk*, B *škas*, Skt. *ṣaṭ* (from **saṭṣ*), Avest. *xšvaš*, Arm. *vec'*, Gk. *héks* (dial. *wéks*), Alb. *gjashtë*, Lat. *sex*, OIr. *sé*, Goth. *saihs*, OIcel. *sex*, OHG *sehs* (Ger. *sechs*); OE *si(ē)x* (Engl. *six*), Lith. *šeši*, OCS *šestŭ*. Toch. A *škāšt*, B *škaste* 'sixth', Skt. *ṣaṭthá-*, Avest. *xštva-*, Arm. *vec'erord*, Gk. *héktos*, Alb. *i-gjashtëtë*, Lat. *sextus*, *sestus*, OIr. *sessad*, Goth. *saihssta*, OHG *sehsto*, *sehto*, OIcel. *sétte*, Lith. *šēštas*, OCS *šestŭ*.

PIE ***sephthm** 'seven', ordinal ***sephth-mo-** 'seventh': Hitt. *šipta-*, Toch. A *špāt*, B *šuk(t)*, Skt. *saptá*, Avest. *hapta*, Arm. *ewt'n*, Gk. *heptá*, Lat. *septem*, OIr. *secht n-*, Goth., OHG *sibun* (Ger. *sieben*), OE *seofon* (Engl. *seven*), Lith.

12. In Anatolian the original Indo-European word for 'four' is replaced by Hitt. *me(i)u-*, Luw. *mawa-*.

septyni, OCS *sedmī*. Skt. *saptamā-* 'seventh', Pers. *haftum*, Gk. *hébdomos*, Lat. *septimus*, OIr. *sechtm-ad*, OLith. *sėkmas*, OPruss. *sep(t)mas*, OCS *sedmŭ*.

PIE **oḱhthō(u)* 'eight': Toch. A *okāt*, B *okt*, Skt. *aṣṭā*, *aṣṭāu*, Avest. *ašta* (cf. Avest. *ašti-* 'width of four fingers'), Arm. *ut'* (probably from **ophthō*, with *ph* under the influence of the preceding number 'seven': see Pokorny 1959:775), Gk. *oktō*, Alb. *tētē*, Lat. *octō*, OIr. *ocht n-*, Goth. *ahtau*, OIcel. *átta*, OHG *ahto* (Ger. *acht*), OE *eahta* (Engl. *eight*), Lith. *astuo-ni*, OCS *osmī*.

PIE **neu(e)n-* 'nine': Toch. A, B *ñu*, Skt. *náva*, Avest. *nava*, Arm. *inn*, Gk. *ennéa*, Alb. *nëndē*, Lat. *nouem*, OIr. *noí n-*, Goth., OHG *niun* (Ger. *neun*), OE *nigon* (Engl. *nine*), Lith. *devyni*, OCS *devęti*. Ordinal: Toch. B *ñunte*, Gk. *eínatos* 'ninth', Goth. *niunda*, OHG *niunto*, OE *nigoða*, Lith. *deviñtas*, OPruss. *newīnts*, OCS *devętŭ*.

PIE **t'ekḥm̥* 'ten': Toch. A *śāk*, B *śak*, Skt. *dāśa*, Avest. *dasa*, Arm. *tasn*, Gk. *déka*, Lat. *decem*, OIr. *deich n-*, Goth. *taíhun*, OE *tien* (Engl. *ten*), OHG *zehan* (Ger. *zehn*). With suffix **-th-*, **t'ekḥm̥-th-*: OPruss. *dessimpts*, Lith. *dėšimts*, OCS *desęti*. Originally the suffixed form meant 'group of ten; decade', hence **kḥm̥thom* from **(t')kḥm̥thom* '100' (see Pokorny 1959:192): Toch. A *kānt*, B *kānte*, Skt. *śatām*, Avest. *satəm*, Gk. *hekatón*, Lat. *centum*, OIr. *cét*, Goth. *hunda*, OE *hund*, Lith. *šimtas*, Latv. *simts*, OCS *sŭto*.

10.3.4. The Indo-European counting system as based on ten. The words for '100' and the decades

The clearest evidence that the Indo-European counting system was based on ten is the fact that '100' is derived from '10': **kḥm̥thom* '100' beside **t'ekḥm̥* 'ten'. The following words for the decades are also based on 'ten'.

PIE **wī-kḥm̥th-(iH)-* 'twenty', lit. 'two tens'; cf. **(t')wi-* 'two' and **(t')kḥm̥th-* 'decade' (see Pokorny 1959:1177, Szemerényi 1960:129-36):¹³ Toch. A *wiki*, B *ikām* (cf. Toch. B *ikante* 'twentieth': Van Windekens 1976:572), Skt. *vimśatī-*, Pali *vīsam̐*, Avest. *vīsaiti*, Arm. *k'san*, Gk. (Dor., Boeot., Thess.) *wíkati*, (Att.) *eíkosi*, Alb. *një-zet*, Lat. *uigintū*, OIr. *fiche*. More recent Germanic and Balto-Slavic formations follow the same model

13. **wī-kḥm̥th-iH-* 'twenty' goes back to **t'wī-t'kḥm̥th-iH-*; the long **ī* of the first element is due to loss of **t'* in the decessive cluster **-t'kḥ-* of the second element, with compensatory lengthening of the preceding sonant **ī*; the glottalization of the **t'* must have had something to do with the lengthening (for accessive and decessive consonant clusters see I.2.6.3 above). The influence of glottalization on a preceding vowel or sonant can be compared to the effect of the laryngeals. The length of the sonants and vowels in the terms for the following decades is to be explained analogously (for a similar account of this lengthening see Szemerényi 1960:136). The laryngeal proposed for these compounds in traditional accounts has no morphological justification and is motivated only by the need to interpret the long vowel or sonant, whereas the lengthening receives a realistic explanation when the glottalization of the initial consonant of 'ten' is taken into account.

(Szemerényi 1960:130, Mažiulis 1956): Goth. *twai-tigjus* '20' (lit. 'two tens'), OIcel. *tuttugu*, OE *twen-tig* (Engl. *twenty*), OHG *zwein-zug* (Ger. *zwanzig*); Lith. *dvidešimt*, OCS *dŭvadesęti* '20' (lit. 'two tens').

PIE **thrī-k̑homth-* '30', lit. 'three tens', from **thri-* 'three' and **(t')k̑homth-*: Toch. A *taryāk*, B *tāryāka*, Skt. *trīṃśat*, Avest. *θrisat-*, Arm. *eresun*, Gk. *triákonta*, Lat. *trīgintā*, OIr. **tricho*; cf. the later formations of Goth. **þreis-tigjus* '30' (lit. 'three tens'), Lith. *trisdešimt*, OCS *tridesęti*.

PIE **khoethwē-k̑homth-* '40', lit. 'four tens', from **khoethwe/or-* 'four' and **(t')k̑homth-*: Toch. A *štwarāk*, B *ś(t)wārka*, Skt. *catvāriṃśat*, Pali *cattarīsam*, Avest. *čaθwarəsātəm*, Arm. *k'arasun*, Gk. (Dor.) *tetrókonta*, Lat. *quadrāgintā*, OIr. *cethorcho*; cf. the later formations of Goth. *fidwōr-tigjus* '40' (lit. 'four tens'), Lith. *keturiasdešimt*.

PIE **phenkhoē-k̑homth-* '50', lit. 'five tens', from **phenkhoe* 'five' and **(t')k̑homth-*: Toch. A *pñāk*, B *pśāka*, Skt. *pañcāśat*, Avest. *pančāsāt*, Arm. *yisun*, Gk. *pentékonta*, Lat. *quīnquāgintā*; later formations in Goth. *fimf-tigjus* '50' (lit. 'five tens'), Lith. *penkiasdešimt*.

PIE **śoe k̑hs-k̑homth-* '60', lit. 'six tens', from **śoe k̑hs-* 'six' and **t'k̑homth-*, with the initial **t'-* of 'ten' lost without a trace because it was preceded by a consonant in this compound:¹⁴ Toch. A *sāksāk*, B *škaska*, Arm. *vat'sun*, Gk. *heksékonta*, Lat. *sexāgintā*, Mlr. *sesca*. In Gk. *heksékonta* and Lat. *sexāgintā* the long link vowels arise by analogy to Gk. *pentékonta*, Lat. *quīnquāgintā* '50' (Szemerényi 1960:5). Cf. also later formations in Goth. **saihs-tigjus* '60' (lit. 'six tens'), Lith. *šešiasdešimt*.

PIE **sephthm̐-k̑homth-*¹⁵ '70', lit. 'seven tens', from **sephthm̐* 'seven' and **(t')k̑homth-*, with **t'-* lost in the initial cluster of 'ten' and the preceding sonant lengthened: Toch. A *šāptuk*, B *śuktanka*, Arm. *ewt'anasun*, Gk. *hebdomékonta*, Lat. *septuāgintā*, OIr. *sechtmogo*; cf. also Goth. *sibun-tēhund* (Szemerényi 1960:27-44) beside later formations in OIcel. *siau tiger* '70' (lit. 'seven tens'), Lith. *septyniasdešimt*.

PIE **ok̑hthō-k̑homth-* '80', lit. 'eight tens', from **ok̑hthōu* 'eight' and **t'k̑homth-* 'decade': Toch. A *oktuk*, B *oktanka*, Arm. *ut'sun*, Hom. Gk. *ogdōkonta*,¹⁶ Lat. *octōgintā*, OIr. *ochtmoga*, cf. Goth. *ahtau-tēhund* beside later formations in OIcel. *átta tiger* 'eight tens', Lith. *aštuoniasdešimt*.

PIE **newn̐-k̑homth-* '90', lit. 'nine tens', from PIE **neu(e)n-* 'nine' and **t'k̑homth-* 'decade', with **t'-* lost from the initial cluster of 'ten' and the

14. If a laryngeal is posited as a link element in '20', '30', '40', etc. (see note 13), then a laryngeal should also be expected in '60'. The fact that '60' contains no such laryngeal shows that the traditional account of '20', etc. is incorrect and our explanation of the vowel and sonant length in '20', etc. as due to loss of a glottalized consonant is a natural one.

15. For evidence for a long sonant **m̐* in '70' see Szemerényi 1960:6-11.

16. For Homeric *ogdōkonta* '80' as a reflex of the Indo-European form see Szemerényi 1960:12-13.

preceding sonant lengthened: Toch. A *nmuk*, B *ñumka*, Arm. *innsun*, Hom. Gk. *ennēkonta*, Gk. *enenēkonta*, Lat. *nōnāgintā*, Mlr. *nócha*, cf. Goth. *niun-tēhund* beside later formations in OIcel. *nío tiger* ‘nine tens’, Lith. *devyniasdešimt*.

All the Indo-European names for the decades, from ‘20’ to ‘90’, are actually phrases formed by combining the units ‘two’ through ‘nine’ with ‘ten, decade’. The combined forms, with phonetic changes at the boundary, yield the attested Indo-European decade names.

The numerals from 11 to 19, as well as 100, are reconstructed as free combinations of words for the units plus ‘decade’ or ‘hundred’. The conjoined forms fuse and give various reflexes in the dialects, such as Gk. *héndeka* ‘11’, *dódeka* ‘12’, etc., OIcel. *þrettán*, OE *þrēo-tiene* (Engl. *thirteen*) ‘13’, Lat. *quadringenti* ‘400’, *quīngenti* ‘500’.

No single word for ‘1000’ can be reconstructed for Indo-European. Different dialect groupings have different words, whose original meanings were ‘great multitude’ or ‘large number’: Goth. *þūsundi*, OIcel. *þúsund*, OE *þūsend* (Engl. *thousand*), OHG *dūsunt*, *thūsunt* (Ger. *tausend*), OPruss. *tūsimtons*, Lith. *tūkstantis*, OCS *tysešti* ‘1000’ (etymologically **thus-k̑mthyom* ‘strong hundred’; for the semantics, cf. Toch. A *wāłts*, B *yāłtse* ‘1000’, lit. ‘large number, great number’ (cf. OCS *velījŕ*, *velikŭ* ‘large, great’); Skt. *sa-hásram* ‘1000’, Avest. *hazaγrām*, Gk. *khílioi*, Lat. *mille* ‘1000’, etc.

10.3.5. Traces of an archaic Indo-European system of counting on the fingers

The base-ten counting system characteristic of late Indo-European at the time of the breakup is not the original Proto-Indo-European one: we can detect traces of a typologically more archaic counting system in the ancient Indo-European names for the units ‘two’ through ‘ten’.

PIE **tʷo-* ‘two’ is the original name for the number with which counting began in Proto-Indo-European.

**threi-* ‘three’ is the original Indo-European word for the number following ‘two’.

**kʰoethwe/or-* ‘four’ is the original Indo-European word for the number following ‘three’.

**phenkʰoe* ‘five’ can be etymologized as ‘hand, five fingers’, which points to an archaic system of counting on the fingers. The original meaning can be seen in the cognates Goth. *figgrs*, OIcel. *fingr*, OE, Engl. *finger*, OHG *finar* (Ger. *Finger*); probably also cognate is Hitt. *pankur* ‘total, clan’, *panku-* ‘all, whole’ (evidently from an original Indo-European meaning ‘total of fingers’: see Polomé 1968, Lehmann 1970). **phenkʰoe* in both the meanings ‘whole hand, all five fingers’ and ‘five’ could also appear with suffixed **-th-* as **ph(e)nkʰo-th-* (for the inactive class marker **-th-* in forms such as

***yekhoṛ-th-** 'liver', ***w(e/o)tṛ-th-** 'water', etc. see above): for 'five' cf. Skt. *pañktī-*, OCS *pęťi*, and possibly OIcel. *fimt*, Umbr. *puntis* (but see Szemerényi 1960:105-13); for 'hand', OHG *fūst* (Ger. *Faust*) 'fist', OE *fȳst* (Engl. *fist*), OCS *pęstŭ*, Russ. *pjast'* 'metacarpus', Lith. *kūmstė* 'fist' (from **punkstė*: Saussure 1922, Szemerényi 1960:113, q.v. for previous literature). The same suffixed form may underlie Gk. *pās*, gen. *pantós* 'all, total', Toch. A *pont-*, *puk*, B *po*, *pont-* 'all, each' (van Brock 1972), with simplification of ***-nkhoth-**.

PIE ***šoeḱhs-** 'six' is the unetymologizable original word for the number following ***phenkhoe** 'five; total of fingers'. The connection of this word with Gk. *aéksō* '(I) make larger, increase' (see Szemerényi 1960:79, note 55) is dubious in view of formal difficulties.

***sephthm** 'seven' is the unanalyzable word for 'seven', considered by a number of scholars to be a borrowing from Semitic (see Illič-Svityč 1964:7, with further references).

***oḱhthō(u)** 'eight'. This numeral is dual in form and must be interpreted as having originally meant a doubling of a number to yield 'eight', i.e. a doubling of 'four'. Thus ***oḱhthō(u)-** must originally have meant 'two times four'. The original meaning 'four' of ***oḱhth(o)-** suggested by this analysis is still reflected in Avest. *ašti-* 'width of four fingers'.¹⁷ Thus two forms of the word for 'four' can be posited for Proto-Indo-European; one of them, ***oḱhtho-**, had the concrete meaning 'four fingers'. Hence 'eight' was understood as 'two times four' and was derived from one of the forms meaning 'four'. This shows traces of an archaic base-four counting system, subsequently replaced by the base-ten system (see Bremer 1924, Knobloch 1952, Burrow 1955 [1976:244], Erhart 1965).

It is significant that the number following 'eight' is called ***newen-** 'nine'. The word is etymologically connected to ***newo-** 'new', and nine was thus seen as the new number after completion of a cycle which ended with eight (see Pokorny 1959:319, Szemerényi 1960:173).

The number ***t'eḱhmth-** 'ten' occupies a special place in the archaic Indo-European finger count. The word for 'four fingers', ***oḱhth-** (together with the general word for 'four', ***khoethwe/or-**), is opposed to ***phenkho(th)-** 'all the fingers of one hand', i.e. 'five' (properly 'fist with clenched fingers'). Ten is properly the fingers of two hands, the culmination of the first cycle of the finger count. And in fact ***t'eḱhmth-** can be etymologized as 'two hands': ***t'oe-** 'two' + ***ḱhmth-** 'hand (with outstretched fingers)'; for 'hand' cf. Goth. *handus*, OE, Engl. *hand*, OHG *hant* (Ger. *Hand*) (see Jensen 1952, Szemerényi 1960:69 and references therein).

Thus we can distinguish two sets of archaic Indo-European numerals in the

17. For the typological plausibility of 'eight' as an altered form of 'four' cf. Old Japanese *ya* 'eight' beside *yō* 'four' (R. Miller 1971:227-29), Burushaski *w-ālti* 'four', *ālt-ambi* 'eight' (Klimov and Edel'man 1970:46), Yukagir *jalaklan* 'four' and *mālaljaklan* 'eight' (2 x 4; Krejnovič 1958:182-84), and several northern Austronesian numerals (Dyen 1971:43).

first decade: those from two to four (primary terms for numbers) and those from five to ten (most of them etymologizable as having to do with hands or fingers, and thereby reflecting an archaic Indo-European finger count). This division into two sets finds support in grammatical features of the numerals' structure and in their syntagmatic functioning. This conclusion can be drawn on the basis of agreeing evidence from the majority of the ancient Indo-European dialects: Tocharian, Indo-Iranian, Armenian, Greek, Balto-Slavic, Celtic.

The numerals from two to four are evidently old adjectives, which agreed in gender, number, and case with the word denoting the object counted. The numerals from five to ten are old nouns, which stood in an appositive relation to the word for the object counted (see Meillet 1937:410, 412 [1938:410], Suprun 1969:92ff., 144-45, 196).

10.4. Number symbolism and traces of an archaic Indo-European calendar

10.4.1. Numbers with symbolic meaning in Indo-European

In archaic Indo-European tradition some of the numbers had acquired special symbolic values. This is true primarily of two, three, and four, but also of seven and twelve. Number symbolism is reflected in many early Indo-European traditions.

The symbolic value of two is shown in the special significance of the twin cult and its associated paired symbols, in paired mythic designations like Skt. *dyāvā-prthivī* 'heaven and earth' (dual), and in the principle of binarism which permeates the entire mythological and semantic system of the ancient Indo-European model of the world (for which see Chapter 8).

10.4.2. The symbolism of the number three. Ternarism in the Indo-European mythological model of the world

The number three had sacral meaning in the views of the ancient Indo-Europeans, and often determines the number of basic significant ritual and mythic units. There are three main gods in the pantheon: the Roman Jupiter, Mars, and Quirinus (see II.8.3.9) who constituted the Capitoline triad, which has correspondences in Umbrian tradition as well (Dumézil 1966:281-306); in Old Icelandic tradition, *Óðinn*, *Þórr*, and *Njǫrðr* (Polomé 1970). Three-headed personages are attested in many Indo-European traditions. They include the three-headed monster of the Rigveda and the Avesta; their killers, whose names

are formed from 'three': Skt. *Tritá- āptiá-* (one of three brothers), Avest. *θrita-*; and a three-headed monster in Slavic folklore.¹⁸

In Indo-European mythological epos, three personages are frequently united or function as a single whole (like the three heroes of East Slavic epos). In Celtic epic, one personage is the son of three fathers, *Mac Tri Con*, lit. 'son of three dogs' (see Vendryes 1952:237). In the archaic Celtic incest myth (see II.8.1.4), as a result of incest between a sister and her three brothers, the *Findemna* (lit. 'charming triplets'), the sister gives birth to a son *Lugaid tri riab n-derg* 'Lugaid with three red scars' (Dumézil 1971:346-47). This motif echoes the even more archaic Hittite myth of thirty brothers who incestuously marry their thirty sisters (see Otten 1973). In this case the number thirty can be regarded as a transformation of the symbolic number three (thirty as three tens); this occurs in a number of other instances, for instance in the symbolism of 30 and 33 in Roman rites.¹⁹

The special significance of the number three in ancient Indo-European mythic conceptions is also evident in the ternarism of the Indo-European model of the world and hence in the division of the Cosmic Tree into three parts, the upper, middle and lower worlds, among which all living things are divided (see II.1.4).

10.4.3. *The symbolism of the number four and the Indo-European system of seasons*

The symbolism of the number four in archaic Indo-European tradition is more restricted and less significant than that of the number three. The symbolic value of 'four' is visible primarily in the structure of ritual, determining its organization and spatiotemporal properties. In ancient India and Rome two kinds of altars, and later two kinds of temples, were distinguished: four-cornered ones, oriented according to the four compass directions and regarded as altars or temples of the sky, and round ones, temples of the earth (Dumézil 1966:308-15). The same picture can be reconstructed for archaic Greek religion, as is shown in the opposition of the acropolis (Hom. Gk. *akrópolis*) and the agora (Hom. *agoré* 'square, forum, meeting place'): Vernant 1969:180.

A number of traditions reflect a connection of the number four with the thunder god, who is associated with the fourth day of the week: in Baltic tradition, Lith. *Perkūno diena* 'Perkunas's day; Thursday'; in Slavic, Polab. *Peräune dän* 'Perun's day' (Pisani 1956); in Germanic, Olcel. *þórsdagr* 'Thor's

18. In addition to three-headed monsters, nine-headed monsters also appear in these traditions (see Ivanov and Toporov 1965:86) — three times three-headed.

19. For instance, in the Roman *comitia curiata* each of the three ancient tribes of Rome was represented by ten people and one augur, for a total of 30 people and three augurs (Dumézil 1948).

day, Thursday' (cf. OE *þūresdæg*, Engl. *Thursday*), Ger. *Donnerstag* 'Thursday', lit. 'Thunder (god)'s day', cf. Lat. *Iovis diēs* 'Jupiter's day' (Fr. *jeudi* 'Thursday'); all of this has a precise correspondent in Sanskrit tradition, where the thunder god Indra is associated with the number four (Ivanov and Toporov 1974:24-25). This is probably connected with the conception of the thunder god (and several other gods) as having four hypostases, as is true in particular of Lithuanian and some Slavic traditions (see Jakobson 1970:611).

Of particular interest in connection with the symbolic value of the number four is the mythic image of the four winds associated with the four compass directions, found in various traditions (for the four winds in Proto-Indo-European tradition see II.5.4.3), and, in the Edda, the four dwarfs at the four corners of the sky associated with the four directions; their names were *Austri*, *Vestri*, *Norðri*, *Suðri* (see de Vries 1956:I.255).

The division of the world into four compass directions, which goes back to an extremely archaic period, is evidently responsible for the later four-way classification of other phenomena. In early Greece, for instance, the division of the world into four directions is correlated with the four seasons of the year,²⁰ the

20. The Greek names for the seasons — Hom. *wéar* 'spring', *théros* 'summer', *opōrē* 'fall, end of summer', *kheimōn* 'winter' — form a new four-part division distinct from the ancient three-part system of Indo-European (for which see Nilsson 1911) that was evidently based on agricultural seasons (see II.6.2.6). The three-way system of Proto-Indo-European is still well preserved in the three Hittite seasons, whose names reflect the Indo-European terminology: *gim-*, *gimmant-* 'winter', *zena-*, *zenant-* 'fall', *hamešha-*, *hamešhant-* 'spring, summer' (the latter replacing the older **wes-r-/n-*): see Goetze 1951 (but the four-part system is assumed by Hoffner 1974:15ff.). Most other archaic Indo-European dialects preserve the Indo-European words for 'winter' and 'spring, summer', but a new term for 'summer' arises and the word for 'fall' is replaced in most of the dialects except Anatolian, Armenian, and Balto-Slavic. These changes show a tendency to form a four-part system like the Greek one. Cf. also the Latin four-part system: *uēr* 'spring', *aestās* 'warm part of year; spring and summer', *autumnus* 'fall' (from September 22 to December 22), *hiems* 'winter'. While some ancient terms are preserved (Gk. *wéar* 'spring', Lat. *uēr*; Gk. *kheimōn* 'winter', Lat. *hiems*), in Greek (as in Latin) a new system of four seasons arises, with the consequence that the original meanings of the inherited terms are changed. A new four-part system also arises in Slavic, with the ancient word for 'fall' preserved: *vesna* 'spring', *lēto* 'summer', *jesenī* 'fall', *zima* 'winter'; the innovation *lēto* preserves its earlier meaning 'year' in addition to 'summer'. Schematically, the transformations of the Proto-Indo-European system of seasons are:

Proto-Indo-European

**wesr-/n-*
'spring and
summer'

**sen-*
'summer and
fall'

**gheim-*
'winter'

Hittite

hamešha-
'spring and
summer'

zena-
'summer and
fall'

gima-
'winter'

four divisions of the Ionic-Attic tribe (in Aristotle), the four elements of the universe (in Ionian cosmogony), and the four liquids of the human body (in Hippocrates): see Thomson 1959:119.

10.4.4. The symbolism of the number seven and traces of a lunar week

The symbolic value of the number seven is particularly clear in mythology and rituals. Seven is the number that defines a special group of deities or mythological personages. Indo-Iranian distinguishes a unity of seven gods (OIran. *Hafta-daiva*- 'seven gods'): Avest. *Ahura- Mazdā*-, *Vōhu- Manah*-, *Aša- Vahišta*-, *Xšaθra- Vairya*-, *Spənta- Ārmaiti*-, *Haurvatāt*-, *Amərətāt*- (see Abaev 1962); cf. also the possible interpretation of ORuss. *Semargl*' as 'seven-headed (seven-membered) deity' (Ivanov and Toporov 1965).²¹ The ancient mythological significance of the number seven is also revealed in the groups of seven sacrificial animals in an Indo-European (early Old Iranian) burial in Sintasht (first half of second millennium B.C.).

It must be assumed that the sacral meaning of the number seven is based on the use of the seven-day week as a basic calendar unit. This is especially clear in the Avestan calendar, where the first seven days of the month have the names of the seven immortal Old Iranian gods cited above (see Livšić 1976).²²

It is entirely possible that the ancient Indo-Europeans distinguished the lunar week as a calendar unit. Evidence for the lunar week is the established fact that the fourth day was named for the thunder god. However, neither the names of the other days of the week, nor a word for 'week' in general, can be reconstructed.

Greek			
<i>wéar</i> 'spring'	<i>théros</i> 'summer'	<i>opóřē</i> 'fall'	<i>kheimōn</i> 'winter'
Latin			
<i>uēr</i> 'spring'	<i>aestās</i> 'summer'	<i>autumnus</i> 'fall'	<i>hiems</i> 'winter'
Slavic			
<i>vesna</i> 'spring'	<i>lěto</i> 'summer'	<i>jesen'</i> 'fall'	<i>zima</i> 'winter'

21. A female name in Old Hittite attested in the Cappadocian tablets is interesting in this connection: *Šaptama-niga*- 'seventh sister', from Hitt. *šep(a)(ma)*- 'seven' plus *nega*- 'sister' (Neumann 1974:278).

22. It has been suggested that the seven-day week may have been preceded by an earlier four-day week whose days may have been named for gods (Strutynski 1975).

10.4.5. The symbolism of the number twelve

The sacral significance of the number twelve in Proto-Indo-European can be established most clearly from the agreeing evidence from rituals in the archaic Indo-European traditions. Twelve is the number of basic body parts that a sacrificial animal is divided into during healing rites in the Hittite and Anatolian traditions (see II.9.2.2). This corresponds to the 'twelve gates of the soul' in Old Irish medical texts (Meid 1974:28) or the twelve mythic embodiments of diseases in Slavic traditions (Ivanov and Toporov 1965, Toporov 1971). In ancient Greece the number twelve was a basic one in the early period, defining the number of gods (the twelve gods of Plato and Phidias), the number of subdivisions of a tribe, and so forth (Vernant 1969:164).

This sacral meaning for the number twelve in Indo-European was probably connected with the division of the year into twelve months. The twelve-month year is attested in a number of archaic Indo-European traditions: Indo-Iranian, Greek, Italic, Slavic, and others.

Section Two

**The Chronology of
Proto-Indo-European. The
Indo-European Homeland and
Migration Routes to the Historical
Territories of the Indo-European
Tribes**

Chapter Eleven

Proto-Indo-European in space and time, based on linguistic and culture-historical data

11.1. The chronology of Proto-Indo-European

11.1.1. Time and space as obligatory categories for the concrete reality of a protolinguistic system

The fundamental question concerning the concrete existence of a protolanguage is its location in space and time. Thus for Proto-Indo-European the fundamental question in this area is the chronology and territory of the protolanguage whose breakup led to the formation of the historical daughter dialects.

11.1.2. The chronology of Proto-Indo-European in the light of evidence concerning the Anatolian linguistic system. The earliest Anatolian onomastics and hydronymics

The soundest evidence for establishing the lower chronological limit of a protolanguage is the dating of written evidence from its descendant languages. In the case of Proto-Indo-European, the *terminus post quem non* is the very beginning of the second millennium B.C., the time of first attestation for Hittite and other Anatolian languages.

The Cappadocian tablets (in Akkadian) from Old Assyrian trade colonies in Asia Minor, dating to the end of the third and beginning of the second millennium B.C., contain a large number of personal names that can be etymologized on the basis of individual Anatolian languages. This is clear evidence that individual Anatolian languages, viz. Hittite and Luwian, had already crystallized well before that time. Particularly strong evidence comes from the following names (Laroche 1966a:298ff.).

Suffix *-uman* (cf. the Hittite relational, or gentilic, suffix *-uman-*, *-umn-* vs. Luw. *-uwan-*): *Ar-nu-ma-an* (cf. Hitt. *ar-nu-* ‘bring’), *Ta-ak-ša-nu-ma-an* (cf. Hitt. *takš-* ‘make’, *takšan-* ‘half’), *Ḫa-ar-šu-um-nu-ma-an* (cf. Hitt. *ḫarš-* ‘loosen’), *Ša-ak-ri-ú-ma-an* (cf. Hitt. *šakkar* ‘excrement, dirt, filth’), *Ša-li-nu-ma-[an]* (cf. Hitt. *šalli-* ‘large’), *Šu-pí-ú-ma-an* (cf. Hitt. *šuppi-* ‘clean’),

Ĥi-iš-tù-ma-an (cf. Hitt. *LÚĥe-eš-tu-u-um-ni* ‘people of the house of bones’ (*É ĥešta-*), cf. *ĥaštai* ‘bone’), *Ta-wa-ú-i-ma-an* (cf. Luw. *tawi-* ‘eye’): Goetze 1954:351-52.

Suffix *-nika* (cf. Hitt. *neg-a-* ‘sister’ vs. Luw. *nanašri-* ‘sister’): *Ĥa-šu-ša-ar-ni-kà* (cf. Hitt. *ḥaššušara-* ‘queen’), *Šu-pi-a-ni-kà* (cf. Hitt. *šuppi-* ‘clean’), *Ša-ap-ta-ma-ni-kà* (cf. Hitt. *šepa[m]-* ‘seven’): Friedrich 1952:303; cf. the ideographic writing D.VII.VII.BI ‘unity of seven, Heptad’ in lists of Hittite gods: Goetze 1953:266), *Ša-am-na-ni-kà* (cf. Hitt. *šamana-* ‘basis, foundation’): Neumann 1974:279, Goetze 1954:352-53).

Suffix *-šar* in female names (Hitt. *-šara-*, suffix in words referring to women: *ḥaššu-* ‘king’, *ḥaššuššara-* ‘queen’), often preceded by *-aḥšu-*:¹ *Ĥi-iš-ta-aḥ-šu-šar* (cf. Hitt. *ĥešta-* ‘bones’), *Ni-wa-aḥ-šu-ša-ar* (cf. Hitt. *newa-* ‘new’).

Names with *-aš(š)u-* as second element (cf. Hitt. *aššu-* ‘good’ vs. Luw., Pal. *wašu-*): *Ĥa-al-ki-a-šu* (cf. Hitt. *ḥalki-* ‘grain’), *Ni-wa-šu* (cf. Hitt. *newa-* ‘new’), *Ša-ar-ni-kà-šu* (cf. Hitt. *šarnink-* ‘compensate’), *Ut-ru-wa-šu* (cf. Hitt. *wattaru-* ‘spring’).

Names with suffix *-att* (cf. Hitt. abstract suffix *-att-*, e.g. in *šiwatt-* ‘day’): *A-ši-at* (cf. Hitt. *aššiya-* ‘love’ and deity name *Aššiyat-*: see Goetze 1953), *Tá-ar-ḥa-ši-at* (cf. Hitt. *tarḥ-* ‘conquer’).

Also relevant are *Ši-wa-áš-me-i* from Hitt. *šiu-*, *šiwa-* ‘god’ (vs. Luw. *Tiwat-* ‘sun god’, Pal. *Tiyat-*), *I-na-ar* (cf. Hitt. *innara-* ‘strength’ and name of a god, vs. Luw. *annari-*), *Na-na-a* (cf. Luw. *nani-* ‘brother’), *Na-na-pi* (cf. later Hittite names in *-pi* such as *Ĥanta-pi*), *Ša-ar-pa* (cf. Hitt. *šarpa-* ‘sickle’), *Tár-ḥu-a-an* and *Ta-ar-ḥu-a-lá* (cf. Hitt. *tarḥ-* ‘conquer’).

These Anatolian names from a document dating to the end of the third or beginning of the second millennium B.C. show unambiguously that the separate Anatolian languages had already undergone a very long period of individual development by that time, in addition to the separate development of Common Anatolian after its split from Proto-Indo-European.² Therefore the split of

1. There are also Cappadocian names in *-aḥšu*, e.g. *A-ra-wa-aḥ-šu* (cf. Hitt. *arawa-* ‘free’), *I-lá-li-aḥ-šu* (cf. Hitt. *ilaliya-* ‘wish, want’, and a god’s name derived from it found in an Old Hittite text, D.II.II.II.II: Laroche 1965c:114), *I-na-ra-aḥ-šu* (cf. Hitt. *innara-* ‘strength’), *Pè-er-wa-aḥ-šu* (cf. the Hittite god name *Pirwa-*), *Šu-pi-a-aḥ-šu* (cf. Hitt. *šuppi-* ‘clean’). For the possible ancient meaning ‘son’ of *-ḥšu-*, probably connected with *ḥaš-* ‘give birth’, *ḥašša ḥanzašša* ‘grandsons and great-grandsons’, see I.3.2.3 above.

2. By the beginning of the second millennium B.C. Hittite and Luwian already reveal essential structural differences which presuppose a long period of separate development for these dialects after the split of Proto-Anatolian from Proto-Indo-European. Phonetic differences have been mentioned above; they include Hitt. *e* : Luw. *a* (Hitt. *ešdu* ‘may it be’ : Luw. *ašdu*, Hitt. *ešḥa-* ‘lord, master’ : Luw. *wašḥa-*); Hitt. *ši-* : Luw. *ti-* (Hitt. *šiwatt-* ‘day’ : Luw. *Ṭiwat-* ‘sun god’); Hitt. *-zi* : Luw. *-ti* (Hitt. *paizzi* ‘he goes’ : Luw. *iti* ‘he goes’); Hitt. *g-/k-* : Luw. *Ø-* (Hitt. *keššar* : Luw. *iššari-*, Lyc. *izre* ‘hand’); Hitt. *š-* : Luw. *t-* (Hitt. *šakuwa* ‘eye’ : Luw. *tawi-*, Hitt. *ḥuišwant-* ‘alive’ : Luw. *ḥuitwali-*); and others. There are also differences in grammatical

Anatolian from Proto-Indo-European must be dated to no later than the fourth millennium B.C. and possibly much earlier.

Furthermore, there is reason to believe that the formation and development of the separate historical Anatolian dialects from Common Anatolian (after the split of Common Anatolian from Proto-Indo-European) took place over a long period of time in Asia Minor, i.e. in the historical territory of the Anatolian speakers. This is the conclusion that can be drawn from Anatolian hydronymy.

The oldest names of rivers and lakes in Asia Minor can be analyzed on the basis of the ancient Anatolian languages, with some exhibiting forms that go back to Proto-Anatolian and are no longer attested in the historical languages Hittite, Luwian, and Palaic. For instance, in the Anittas inscription of the eighteenth century B.C. we find a river name *Ḫulana-*, a river in Anatolia (see Neu 1974:33-34). It can be etymologized as ancient Anatolian **Hulna-* 'wave'³ and compared to PIE **Hwl-no-* 'wave': OCS *vlīna*, Lith. *vilnìs*, OHG *wella*, cf. Skt. *ūrmí-* 'wave'.⁴

Also very archaic in structure, with components probably going back to the Proto-Anatolian period, are hydronyms which are compounds with a second element *-ḫapa-* (cf. Hitt. *ḫapa-* 'river'): OHitt. *ḫa-ra-aš-ḫa-pa-aš* 'Eagle River' (KBo III 54 B 13), which coincides with the central European toponym *Arlape*

structure: the verbal past-tense conjugation in *-ḫi*: 1sg. Luw. *-ḫa*, Hitt. *-ḫun*, 3pl. Luw. *-nta*, Hitt. *-ir*; plural noun paradigms: Luw. (and Hieroglyphic Luwian: see Hawkins et al. 1973) nom.pl. *-nzi*, acc.pl. *-nza* beside Hitt. nom.pl. *-eš*, acc.pl. *-uš*; Luw. abl.-instr.sg. *-ati*, pl. *-nzati* beside Hitt. *-az* and *-it*. There are also lexical differences: Hitt. *antuḫša-* beside Luw. *ziiti-* 'person, man', Hitt. *pai-* beside Luw. *i-* 'go', Hitt. *nega-* beside Luw. (and Hier. Luw.: Dunaevskaja 1966) *nana-šri-* 'sister', Hitt. *atta-* 'father' beside Luw. (and Hier. Luw.) *tati-*, Lyc. *tedi*, cf. Pal. *papa-*; Hitt. *akkant-* beside Luw. *u(wa)lant-* 'dead'; Hitt. *-ma* (particle) beside Luw. *-pa* 'but'; Hitt. *-(y)a* (particle) beside Luw. *-ḫa* 'and' (particle); Hitt. *le* beside Luw. *niš* 'don't' (negative imperative particle); Hitt. *kinun* beside Luw. *nanun* 'now'; Hitt. *šuna-* 'god' beside Luw. *maššana-*, Lyc. *mahana-* 'god'; Hitt. *parkui-* 'clean' beside Luw. *ḫalali-* (an ancient Semitic loan, cf. Akkad. *ellu* 'pure, clean'); Hitt. *daluki-* beside Luw. (and Hier. Luw.) *ara-*, *ari-* 'long'; and others. Also relevant are words like Hitt. *aššu-* 'good' beside Luw. (and Hier. Luw.) *wašu-*, Hitt. *ešḫa-* beside Luw. *wašḫa-* 'lord, master', whose phonetic difference (presence vs. absence of initial *w-*) may reflect an ancient Indo-European areal opposition shown by forms such as Gk. *eūs* beside Skt. *vásu* 'goods, possessions', Gaul. *Vesu-*, OGmc. *Wisu-* in compound names. Another significant opposition is Hitt. *daluki-* 'long' (which forms an isogloss with Skt. *dīrghá-*, Avest. *darəga-*, Gk. *dolikhós*, OCS *dligŭ*, OPruss. *ilga*, Lat. *longus*, Goth. *laggs* 'long') beside Luw. *ara-* 'long' (which forms an isogloss with Toch. A *aryu* 'long': Van Windekens 1976:150-51).

3. This word is no longer attested in Hittite in the meaning 'wave'; there is only *ḫulana-* 'wool' (cf. *ḫulaliya-* 'twist'), which may be connected to the same Indo-European root (see above). The absence of a special word *ḫulana-* meaning 'wave' in Hittite can serve as evidence for the probable Proto-Anatolian character of the hydronym *Ḫulana-*.

4. For river names based on **Hwl-n-* 'wave' in other Indo-European dialects cf. e.g. Baltic *Vilnia* (the river which the city Vilnius is named for) and numerous other Baltic and Slavic river names from the same root, among which Baltic hydronyms like *Vėlyš*, *Vilija* have also been included (see Vanagas 1981). Rosenkranz 1966:131 points out an interesting Anatolian name *Ḫulaya-* for the bends of two rivers (KBo IV 10 Vs. 25, 26), which correlates with *Ḫulana-* and is analogous to the Lithuanian names just mentioned.

(> Erlaf) (see Toporov 1975-:I.102; for the semantics see II.2.3.1.3 above; see also Watkins 1973a:84); *Idpar-ma-aš-ḫa[-pa-aš]*, name of a deified river in the city of the same name (for the first component cf. the Gk. hydronym *Parmisós*: Rosenkranz 1966:126); *šu-ra-an-ḫa-pa-aš* (with a first element **šuran-*, unattested in the historical Anatolian dialects). The element *-ḫapaš* is from PIE **Haph-* ‘water, river’, which appears in hydronyms elsewhere in Indo-European: Baltic (OPruss.) *Serenappe*, *Serappin*, *Sarape*, Illyrian *Serapilli* and others (Toporov 1975-:I.98, 1977:94) beside *Ser-* in Thracian *Ser-inis*, *Sér-mē*, *Syr-mus* (see Poghirc 1976:336). For this type of hydronym with a second element *-ap-* from **-Haph-* ‘water, river’ in Iranian, Thracian, Baltic, Illyrian, Celtic, and more generally Ancient European, see Krahe 1960, Toporov and Trubačev 1962:171-72, Trubačev 1968:156.

Numerous hydronyms of Asia Minor, attested in the historical Anatolian languages and going back to Proto-Anatolian, can be compared to the Indo-European derivational type of hydronyms in **-nth-*. A particularly revealing example is *Maraššanta-*, the Halys River of antiquity, the modern Kızıl-Irmak, and the main river of the Hittite kingdom. In addition to the suffix *-anta-* it also contains a suffix *-ašša-*; cf. Daco-Thracian *Marus*, *Marisia*, *Morēsēs* in the Balkans. Its root **mar-* can be etymologized as ‘sea, swamp’ (cf. Hitt. *mammarra-* ‘swamp’, see II.5.3.5 above); for other Indo-European hydronyms with *mor-* (*Mor-ava-* in the Danube basin, the upper Vistula, and the Dnieper and Dniester basins; also, in the same area, *Murakwa*, with a probable Germanic reflex of the second element, beside ancient Balkan *Marus*) see Trubačev 1968:51, Poghirc 1976:336, 337.

Another hydronym of Proto-Anatolian origin and having wide Indo-European connections is *Alda*, a river in Asia Minor (KUB XXV 48 IV 18; cf. the name of a spring *Alda*, KBo II 13 Vs. 23, and Hitt. *aldanni-* ‘spring’): Rosenkranz 1966:129, 131, 138. Analogous river and marsh names are found in the basins of the Dnieper (*Al'ta*, ORuss. *Il'tica*, *L'tica*, *L'to*) and the Danube (*Aloútas* in Ptolemy, cf. Rum. *Olt*), in Macedonia (*Áltos*), Illyria (*Alto*), Pannonia, Lower Mysia (*Altina*; for the suffix cf. Hitt. *aldanni-*), and in central and western Europe (Krahe 1964, Trubačev 1968:167). For other possible comparisons of Proto-Anatolian hydronyms with other Indo-European hydronyms see Rosenkranz 1966.

In addition to river names, a number of ancient toponyms in central Asia Minor also point to ancient settlement of that region by Anatolian Indo-Europeans. The Annals of Hattusilis I name the cities conquered by Hattusilis, among which are *Ḫaššuwa-* (which is mentioned in texts from Ebla dating to the middle of the third millennium B.C.: see Pettinato 1980:52) and *Šallahšuwa-*. These two names can be analyzed as ancient Anatolian: cf. Hitt. *ḫaššu-* ‘king’, *šalli-* ‘large’ and the suffix *-ahšu-* of the ancient Anatolian onomastics seen in the Cappadocian tablets.

11.1.3. The chronology of Proto-Indo-European in the light of evidence concerning the breakup of the Greek-Armenian-Aryan dialect grouping. Mycenaean Greek and its position as a dialect. Proto-Indo-European as a linguistic community datable to the fifth to fourth millennia B.C.

If Hittite and Luwian had separated from Proto-Anatolian and were already differentiated at the end of the third millennium B.C., and if the early differentiation of the Anatolian community took place in Asia Minor,⁵ then the split of Proto-Anatolian from Common Indo-European, and consequently the existence of a Common Indo-European linguistic community itself, must be dated significantly earlier, to the fifth to fourth millennia B.C.

Evidence for the split of other branches from Proto-Indo-European is in agreement with the dating obtained on the basis of Anatolian. After the split of Anatolian and Tocharian, the Indo-European linguistic community that remained (which formed a single dialect grouping in our account of the Indo-European dialect differentiation) began to disintegrate into dialect groups that subsequently yielded the individual historical dialects. In particular, at about the same date the Greek-Armenian-Aryan dialect grouping began to crystallize, later to split into the Indo-Iranian, Greek, and Armenian dialect communities. The existence of a separate Mitannian Aryan dialect in the mid-second millennium B.C., distinct from Sanskrit and Old Iranian (see II.3.1.1.3 above for forms like *aika-wartanna*, *wašanna*, etc.), is evidence that the disintegration of the Aryan dialect community began early, probably no later than the third millennium B.C.

The beginning of the disintegration of Greek linguistic unity must be dated to about the same period. Mycenaean Greek, attested from the fifteenth century B.C.,⁶ shows dialect traits which link it with the Arcado-Cyprian dialect but force one to regard it as an independent Greek dialect on a par with Arcado-Cyprian, Ionic, and Aeolic. Structural traits which distinguish Mycenaean from the other Greek dialects are the following: reflex of syllabic **r* as *-ro-* (in certain positions: see Morpurgo Davies 1967), e.g. Myc. *qe-to-ro-po-* 'four-legged', as in Arcadian, Cyprian, and Aeolic, against *-ra-* in Ionic (cf. Ion. *tetrápoda*); change of Common Greek **ti* to *si* (Myc. *e-ko-si* = *ékhonsi* '(they) have', *di-do-si* = *dídōsi* 'gives', 3sg.), as in Arcado-Cyprian and Ionic, against preservation of **-ti* in the remaining dialects (*ékhonti*, *dídōti*); dative plural ending *-o-i*, *-a-i*, as in Arcadian and Cyprian, beside the more archaic *-oisi*,

5. Further evidence for this claim is lexical borrowings into Proto-Anatolian, in particular Anatolian *pir*, *parn-* 'house' (Hitt. *pir*, gen. *parnaš*, Hier. Luw. *parna-* 'house', Lyc. *prīnawa-* 'build', Lyd. *bira-* 'house'), which evidently goes back to Egypt. *pr* 'house': see II.7.2.1 above.

6. The Mycenaean Greek inscriptions are dated from the fifteenth to thirteenth centuries B.C. (see Ventris and Chadwick 1973, Morpurgo 1963; for the chronology of individual Mycenaean inscriptions from Knossos see also Heubeck 1976). They coincide approximately in time with the Middle Hittite and Late Hittite kingdoms.

-a(i)si of Ionic, Old Attic, Lesbian, Pamphylian; 3sg. middle ending Myc. *-to = -toi* (*e-u-ke-to- = eúkhetoi* ‘announces’), as in Arcadian, beside *-tai* in the remaining dialects, e.g. Ion., Attic *eúkhetai* ‘announces’ (see Risch 1955a, 1979a, Chantraine 1955:32, Schmitt 1977).

There can be no doubt that all the Greek dialects of this period, i.e. the middle of the second millennium B.C., formed independently of one another out of a particular Greek linguistic community which must be dated to an earlier period. The Arcadian, Ionic, and Aeolic dialects must be assumed to have already existed as independent entities by the mid-second millennium B.C. (see Lejeune 1967); they go back to an earlier ‘eastern’ dialect grouping, which dates to the end of the third and beginning of the second millennium B.C.

On the other hand, this entire Greek dialect group — defined by the common origin of Arcado-Cyprian, Aeolic, and other dialects — is opposed to the Doric dialect (and a few other western Greek dialects), which preserves the most archaic traits of the common Greek protolanguage (see Durante 1967).⁷ The split of this protolanguage at the end of the third or beginning of the second millennium B.C. would have yielded on the one hand the eastern dialect group, from which Arcado-Cyprian, Ionic, Aeolic, and others arose, and on the other hand the grouping comprising Doric and some western dialects.

Thus the Greek-Armenian-Aryan dialect grouping which is posited in our scheme of Indo-European dialect differentiation must be dated to no later than the third millennium B.C.; consequently, its split from Proto-Indo-European must be dated to the period immediately following the separation of the Anatolian dialect grouping.

All the foregoing draws on the earliest areal data to date the period when Proto-Indo-European existed as a linguistic system to no later than the fifth to fourth millennia B.C., the date that must be given to the beginning of the Proto-Indo-European dialect dispersal.

11.2. The territorial range of Proto-Indo-European and the Indo-European homeland

11.2.1. *The original territory of the protolanguage*

The claim for the concrete existence of a protolinguistic system associated with a particular period in time also presupposes an approximate determination of the

7. Distinguishing archaic traits of Doric are considered to be the verbal 1sg. ending *-mes* (beside *-men* in other dialects), e.g. *légomes* ‘(we) talk’; a special future-tense form in **-s* (Dor. *dōséonti*); unassibilated endings in 3sg. *-ti* (Dor. *phāti* ‘(he) talks’) and 3pl. *-nti* (Dor. *dídoni* ‘(they) give’; cf. the aspirated *th* in Boeotian: *kaleonthi* ‘(they) call’, *ekhonthi* ‘(they) have’).

boundaries of the original territory of the speakers.⁸ Proto-Indo-European, which existed before dialect differentiation and the splitting off of independent linguistic units, no later than the fourth millennium B.C., must originally have been spoken in a particular geographical area.

11.2.2. *The Indo-European proto-homeland as a geographical region with a mountainous topography*

The original territory of the Proto-Indo-European speakers must have been a geographical region whose ecological, geographical, and culture-historical characteristics corresponded to the picture of the environment that emerges from the reconstructed lexicon of the protolanguages.⁹ The first thing that can be claimed about the homeland with any reasonable certainty is that it was a region with a mountainous topography. The most obvious evidence for this is the great number of Indo-European words denoting high mountains and heights: see the preceding chapters for ***H(e/o)k'o(e/o)r-** 'mountaintop', ***ont'-/*nt'** 'mountain, cliff, stone', ***m(e)n-th-** 'mountain, heights', ***khol-** 'heights', ***bhergh-** 'high' (of mountains). This is a landscape where the mountain oak (***pher-kho-u-** 'oak; cliff', ***aik'** 'mountain oak') and other trees and plants found in regions with high mountains are widespread.

In agreement with this picture is the evidence concerning mountain lakes (***or-u-n-** 'large lake, sea', cf. ***sal-** 'sea or lake as salty') and fast, rushing streams (***Haph-** 'river, mountain stream', ***thekho-** 'flow swiftly'), and the

8. The question of the original territory occupied by the speakers of Proto-Indo-European, or the question of the Indo-European proto-homeland, is almost as old as comparative Indo-European linguistics itself. Its beginning goes back to the rise of linguistic paleontology and the first attempts of archeologists to correlate archeological data with linguistic data. For the history of the question see Devoto 1962:40ff., Mallory 1973, Schlerath 1973.

9. The term 'original' used in reference to the range of the Indo-European protolanguage in a particular territory should be understood, strictly speaking, within the chronological framework of the history of that language — as the region occupied by its speakers at the relevant historical period. The question of where Proto-Indo-European may have come from to that original territory lies outside the scope of the present study. It is entirely possible that the proto-homeland was not the original territory for the earlier history of the language. This question merits consideration in view of theories of a possible relationship of Proto-Indo-European to other reconstructed languages such as Proto-Semitic (for recent work on the topic see Bomhard 1975, 1977), Proto-Uralic (Collinder 1934), and others, and the theory that all these protolanguages are related (the 'Nostratic hypothesis': see Illich-Svityč 1971, 1976, also Collinder 1974). Proto-Indo-European was a branch of an earlier linguistic community, and its speakers must have moved to the 'original' Proto-Indo-European territory from another area, where the concrete existence of the earlier protolanguage subsuming ancestral Proto-Indo-European can be posited.

The same can be said for Proto-Semitic, Proto-Kartvelian, and other protolanguages and their proto-homelands. In particular, the original range of Proto-Semitic, which was obviously in some part of the Near East, must be regarded as secondary from the standpoint of the earlier history of Proto-Semitic, which had previously split off from the Afroasiatic linguistic community: see Diakonoff 1965, 1975.

evidence for a mountain climate with cloudy skies and frequent thunderstorms: ***nebbes-** 'cloud, thundercloud, sky', ***Hwenth-** 'wind', ***Hk'oor-** 'mountain or north wind', ***seu-/su-** 'rain', ***sneigho-** 'snow', ***gheim-** 'winter', ***(y)ek'-** and ***eis-/is-** 'cold, ice'.

Another set of words connected with climatic phenomena precludes locating the Indo-European proto-homeland in the northern regions of Eurasia: ***ghoer-m-** and ***theph-** 'heat, warmth'.

This picture of the Proto-Indo-European landscape naturally excludes the plains areas of Europe which lack significant mountain ranges, i.e. the northern part of central Europe and all of eastern Europe, including the northern Black Sea area.

11.2.3. The Proto-Indo-European flora and fauna as paleobotanical and paleozoological indicators correlating the Indo-European ecological environment with the Mediterranean and Southwest Asia

The Indo-European names for trees and plants include ***t'e/orw-** 'tree; oak', ***pher(kho)-/pheru-** 'oak; cliff', ***aik'-** 'mountain oak', ***k'oelH-** 'acom', ***bherHk'-** 'birch', ***bhaHk'o-** 'beech', ***(s)k'rōbho-** 'hornbeam', ***Hos-** 'ash', ***Hosph-** 'aspen', ***śo(e)likh-** 'willow', ***ei-/oi-** 'yew', ***phith-** 'pine, fir', ***qhar-** 'walnut; nut tree', ***wer-** 'heather', ***wrot'-/wrt'-** 'rose', ***m(e)us-** 'moss'. This inventory agrees with the mountainous topography of the Indo-European proto-homeland and localizes it in relatively more southern regions: the Mediterranean in the broad sense, including the Balkans and the northern part of the Near East (Asia Minor, the mountainous areas of Upper Mesopotamia, and adjacent areas).¹⁰ Oak forests were not characteristic of northern Europe, where they spread only in the fourth to third millennia B.C. (see II.4.1.1.6 above).

In II.1.4 above it was shown that the Cosmic Tree was a basic symbol around which the Indo-European model of the world was built; it was comprised of the totality of all living beings, distributed among three tiers — the upper, middle, and lower worlds. Recent studies have indicated that such a conception could have arisen only in an area rich in forests and was carried into the more northerly steppe region only later (see also Kraig 1978:160).

The relatively southern character of the Proto-Indo-European ecological environment suggested by geographical and botanical evidence is supported by analysis of the Indo-European animal names: ***w|kho-/w|ph-**, ***weit'-(n)-** 'wolf', ***Hrthkh-** 'bear', ***phars-/phart'-** 'panther, leopard', ***leu-** 'lion',

10. This localization is in agreement with the 'beech argument', which excludes the part of eastern Europe to the northeast of the Black Sea up to the lower Volga (see II.4.1.3.3 above); but it is consistent with a location anywhere from the Balkans to the Near East.

***leukh-** 'lynx', ***wl-o-phek̥h(ā)** 'fox, jackal', ***qhweph-** 'wild boar', ***el-(e)n-/el-k̥h-** 'deer, European elk, antelope', ***thauro-** 'wild bull, aurochs, bison', ***k̥has-(no-)** 'hare', ***qhe/oph-** 'monkey, ape', ***yebh-/Hebh-** and ***lebh-onth-/leHbho-** 'elephant; ivory', ***oghoi-/anghoi-** 'snake', ***mūs-** 'mouse', ***k̥harkhar-** 'crab', ***mus-** 'fly', ***lūs-** 'louse', ***ghnit-** 'nit', ***dhghū-** 'fish', ***Hwei-** 'bird', ***He/or-** 'eagle', ***k'er-** 'crane', ***kher-** 'crow', ***theth(e)r-** 'capercaillie, black grouse', ***(s)phikho-** 'woodpecker; small songbird, finch', ***ghans-** 'water bird, goose, swan'. Some of these animals — ***phars-/phart-** 'panther, leopard', ***leu-** 'lion', ***qhe/oph-** 'monkey, ape', ***yebh-/Hebh-** and ***lebh-onth-** 'elephant, ivory', ***k̥harkhar-** 'crab' — are peculiar to southern areas, which rules out central Europe as a possible proto-homeland for the Indo-European tribes.¹¹

11.2.4. *The developed herding and agriculture of the Proto-Indo-European epoch as arguments against locating the homeland in central or eastern Europe*

The evidence against placing the Indo-European proto-homeland in central or eastern (although not southeastern) Europe provided by the reconstructed topography and ecological environment is consistent with culture-historical data on the domestic animals and cultivated plants with which the ancient Indo-Europeans must have been familiar. In the fourth millennium B.C., the time of Proto-Indo-European, herding and agriculture were in a rudimentary state in central Europe (Clark 1952 [1953]), while for Proto-Indo-European we can reconstruct a well-developed system of herding with the basic domestic animals, ***ek̥hwo-** 'horse', ***osono-** 'donkey', ***k'o(o)u-** 'bull, cow', ***Howi-** 'sheep, ram', ***qhok̥-** 'goat', ***k̥hwon-** 'dog', ***sū-** 'pig', ***phork̥ho-** 'piglet', as well as terms for the products of livestock raising and terms having to do with herding, ***Haḱ'-ro-** 'unworked field for grazing livestock', ***phaH-** 'herd, tend livestock', ***wes-ther-** 'herder, shepherd'.

In eastern Europe, in particular the northern Mediterranean area and the Volga steppe, developed herding of this type is known only from the third millennium B.C. on (see Goodenough 1970:255ff., Merpert 1974). In central

11. It is highly significant that approximately the same inventory of plant, animal, and insect names is also reconstructed for Proto-Semitic (see Fronzaroli 1968:V.280ff.): ***nayī-** 'lion', ***labi-** 'lioness', ***nimr-** 'leopard', ***dīb-** 'wolf', ***dabuc-** 'hyena', ***īaḱlab-** 'fox', ***dabb-** 'bear', ***pīl-** 'elephant', ***nūb-(at-)** 'monkey', ***ri'm-** 'aurochs', ***par-** 'onager, wild donkey', ***zaby-(at-)** 'gazelle', ***ayyal-** 'deer', ***wacī-** 'mountain goat', ***arnab-** 'hare'; ***gārib-** 'raven', ***našr-** 'eagle'; ***naḥaš-** 'snake', ***baīm-** 'poisonous snake', ***akbar-** 'mouse; rat', ***dupardac-** 'frog', ***raḱḱ-** 'turtle', ***warn-** 'lizard sp.', ***šaršar-** 'cricket, grasshopper', ***dubb-** 'fly', ***baḱḱ-** 'midge', ***naml-(at-)** 'ant', ***ḱalm-(at-)** 'louse', ***pargu-** 'flea', ***īawlac-(at-)** 'worm', ***alalḱ-(at-)** 'leech', ***nūn-** 'fish'.

Europe, sheepherding, strongly developed among the ancient Indo-Europeans as shown by their elaborated sheepherding terminology (see II.3.1.4), is almost entirely absent until the first millennium B.C. This also agrees with the lack of wool in neolithic Europe (Clark 1952:117-18 [1953:124-25, 235-36], Curwen and Hatt 1953:41). Goat-breeding is first observed in Europe, including eastern Europe, at an even later time (Calkin 1956).

Also characteristic of Proto-Indo-European culture was well-developed beekeeping (***bhei-** 'bee', ***mel-ith-**, ***medhu-** 'honey'), which is known in the Near East from very ancient times.

The developed agriculture which is characteristic of ancient Indo-European society is established on the evidence of reconstructed Indo-European words for cultivated plants (***yewo-** 'barley', ***phūr-** 'wheat', ***līno-** 'flax'), fruit trees (***sām(a)lu-** 'apple, apple tree, fruit tree', ***khr̥no-** 'cornel cherry, cherry', ***moro-** 'mulberry', ***maHlo-** 'apple', ***w(e/o)ino-** 'grape'), tools for working land (***Har-** 'plow' (verb), ***Har-H-thro-m** 'plow' (noun), ***seH(i)-** 'sow', ***sōelkh-** and ***pherkh-** 'furrow', ***serph-** 'sickle'), agricultural seasons (***(e)s-en-** 'harvest time', ***Ham-** 'time of ripening', ***meH(i)-** 'ripen; gather harvest'), agricultural products (***selph-** and ***ongho-** 'oil'), and tools and activities involved in processing agricultural products (***bhrek̑-** 'prepare barley grains over fire', ***pheis-** 'thresh, mill grain', ***mel-** 'grind, crush, thresh', ***k'orāu-** 'mill'; such tools enter Europe from Southwest Asia only during the Iron Age, i.e. in the first millennium B.C.: Clark 1952:113 [1953:120]). This is convincing evidence for locating Proto-Indo-European in those regions where agriculture was most highly developed in the fourth millennium B.C., namely in the same southern area stretching from the Balkans to Iran. The elaborate terminology for agriculture and wine-growing excludes the more northerly regions of Europe. Grains such as barley become a dominant cultivar in Europe only by the end of the second or beginning of the first millennium B.C. (Clark 1952:108 [1953:115]).

Approximately the same Southwest Asian area can be proposed on the evidence of the genetic factor of lactose tolerance in human populations. Well-developed dairying is established for the ancient Indo-Europeans by the numerous words for milk, milk products, and milking (***melk̑-**) as well as by the reconstructed Proto-Indo-European symbolism of the udder (***eudh-**) and milk cow (***k'ou-**) as poetic images of abundance of any kind (see II.3.1.3.3). This suggests lactose tolerance among the Indo-European populations; genetic lactose intolerance is associated with weak development of dairying among many peoples of South Asia (including southern India) and Africa. The genetic feature of lactose tolerance links the ancient Indo-European peoples, for whom dairying played an important role, with several peoples of the northern part of Southwest Asia (see Simoons 1979:61, 63, 74).

11.2.5. *Indo-European wheeled transportation and bronze metallurgy as evidence for locating the original Indo-European territory in Southwest Asia*

Of particular value for establishing the original habitation of the ancient Indo-Europeans is the Indo-European terminology for transport: the words for wheeled carriages (**k^hoel-*, **k^hoek^holo-* 'wheel, wheeled carriage, chariot', **rotho-* 'wheel', **Hwer-th-*, **Hwer-ġh-* 'turn, rotate; wheel, circle; carriage', **His-* 'pole (of carriage)', **dhur-* 'harness', **Ha^khs-* 'axle', **yuk'om* 'yoke', **weġh-* 'carry by vehicle', **yaH-* 'ride in vehicle'), the word for 'bronze' (**Haye/os-*), indispensable for making wheeled carriages from mountain hardwoods, and the word for 'horse' (**e^khwo-*), which must be assumed to have been used as a draft animal in the Proto-Indo-European period, i.e. by the fourth millennium B.C. This set of facts again restricts the original territory of Proto-Indo-European to the region reaching from the Balkans to the Near East and the Transcaucasus as far as the Iranian plateau and southern Turkmenia (see II.6.6 above).

The manufacture of wheeled carriages is dated to about the fourth millennium B.C. Their center of dispersal is recognized to be the region from the Transcaucasus to Upper Mesopotamia (see Childe 1954, Piggott 1969, 1974). From this Near Eastern center they spread to the Volga-Ural region (Gening 1977),¹² the northern Black Sea area (Kuz'mina 1974, 1976, 1977), the Balkans, and Central Europe (see II.6.6.16 and Map 1). The same time period marks the beginning of the Bronze Age in the Near East (Forbes 1950).

This same territory is one of the possible areas where the horse was first domesticated and used as a draft animal, or in any event a center of dispersal for the previously domesticated horse (see II.3.1.1.16).

The elaborate Proto-Indo-European terminology for transport carriages and for the harness and its parts, as well as for horses and bronze, is grounds for placing the Indo-European proto-homeland of the fourth millennium B.C. within the area extending from the Balkans (including the Near East and Transcaucasus) to southern Turkmenia.

There is also reason to reconstruct water transport for the Indo-Europeans: **erH₂-*/**reH-* 'navigate in boat or ship using oars', **naHw-* 'boat, vessel', **phleu-* 'travel by boat'. In the fourth to third millennia B.C., well-developed water transport is known in the Near East, in particular in ancient Mesopotamia: see Childe 1934 [1956], Komoróczy 1976:17ff.

12. For the spread in the Volga-eastern Ural area of details of harness manufacture (connected by definition with the wheel), attested also in the northern Black Sea region and the Balkans in the second millennium B.C. (the Mycenaean period), see Oancea 1976.

11.3. Contacts of Proto-Indo-European with languages of ancient Southwest Asia

11.3.1. *Ancient areal links of Proto-Indo-European with Proto-Semitic and Proto-Kartvelian*

The reconstructed Proto-Indo-European lexicon ranging over various semantic fields, reflecting fauna, flora, economy, and material culture, makes it possible to approximate a geographical region within which the Indo-European proto-homeland may have been located and from which the migrations of Indo-European tribes may have emanated to spread throughout Europe by historical times. Evidence of another order, such as the elements of non-material culture reconstructed from linguistic data and the loans and evidence for interaction of Indo-European with other languages, allows us to further narrow down the region of the possible proto-homeland and restrict it to a more compact area.

The Proto-Indo-European linguistic area must be placed in the Balkan-Turkmenia region proposed above, in some part of it where interaction and contacts between Proto-Indo-European and the Semitic and Kartvelian (South Caucasian) languages could have taken place, since these languages show layers of interborrowings and a number of structural traits pointing to interaction over a long period. The fact of Indo-European-Semitic-Kartvelian interaction points to a Proto-Indo-European homeland in the restricted area within the Near East where such contacts could have occurred, and hence rules out the Balkans as a possible center of Proto-Indo-European dispersal.

Proto-Indo-European, Kartvelian, and Semitic show a distinctive isomorphic structure in their consonantism, which displays three series of stops, defined as glottalized (or pharyngealized, for some of Semitic), voiced, and voiceless (see I.2.5 above).¹³ Kartvelian and Indo-European have identical systems of sonants, with syllabic and non-syllabic variants depending on position in the word. Also identical are the structural canon for root and affixal morphemes and the rules for combining them which involved ablaut alternations of vowels (see I.4.3 for details). Such similarity, complete down to isomorphism of structures and root canons, would be the result of long interaction of these languages in a linguistic area, and their allogenic association with one another (see Cereteli 1968).

13. It is important that all three stop systems were originally characterized by a glottalized series. This can be explained by long-term mutual interaction in some particular geographical area. It should be noted that analogous shared phonological features are also to be observed for a number of other language groups participating in linguistic areas. Typological similarity to the glottalized stop series of Indo-European, Kartvelian, and Semitic can be seen in the glottalized series found in American Indian languages ranging from southern Alaska to central California and comprising at least four distinct genetic groups. Concerning this Sapir (1921:200) observes: "We cannot avoid the inference that there is a tendency for speech sounds or certain distinctive manners of articulation to spread over a continuous area in somewhat the same way that elements of culture ray out from a geographical center." Analogously, glottalization spread in the Caucasus to late Indo-European dialects such as Ossetic (see Szemerényi 1977:376ff.).

Further testimony to this relationship comes from the numerous lexical borrowings observed among the languages of this former linguistic area.

11.3.2. Semitic and Sumerian loans in Proto-Indo-European

The Indo-European lexical stratum which can be regarded as borrowed from Semitic is of particular interest. It comprises primarily words for domesticated animals, cultivated plants, tools, and numerals, i.e. words whose semantics makes them particularly susceptible to borrowing:

PIE ***thauro-** 'wild bull' : Sem. ***tawr-** 'bull, ox': Akkad. *šûru*, Ugar. *tr*, Hebr. *šôr*, Syr. *tawrā*, Arab. *tawr-*, S.Arab. *ṭwr* (see H. Lewy 1895:4, Ipsen 1924:227-28, Illič-Svityč 1964:3, von Soden 1981:III.1287). Borrowing from Semitic into Indo-European is more plausible than the reverse direction, in view of the root structure and the rendition of the Semitic voiceless interdental ***t̪** by means of the voiceless (aspirated) Indo-European ***th**; if the borrowing had gone in the other direction we would expect the Semitic form to show a voiceless (aspirated) ***th** (see also II.2.1.9.1).

PIE ***ghait'-** 'kid, goat' : Sem. ***gady-** 'kid, goat': Akkad. *gadû* 'kid', Hebr. *gedī*, Aram. *gadyā*, Arab. *ḡady-* 'goat' (see Illič-Svityč 1964:3). In Indo-European the word is restricted to one dialect area, Italic-Germanic (Lat. *haedus*, Sabine *faedus*, Goth. *gaits*, Oícel. *geit*, OE *gāt*, Engl. *goat*, OHG *geiz*: Porzig 1954:114 [1964:172]). The fact that an ancient Semitic loan is found in the western Indo-European languages is extremely significant for determining the original Indo-European territory. The borrowed Indo-European word shows several departures from normal Indo-European phonetic structure (combination of Series I and Series II stops in a single root, accessive consonant sequence; for Indo-European root structure see Chapter 4 of Volume I).

PIE ***aghono-** 'lamb, small sheep' : Sem. ***cigl-** 'young animal': Akkad. *agalu* 'donkey', Ugar. *cgl*, Hebr. *cēḡel*, Aram. *cīḡlā*, Arab. *ciḡl-* 'calf' (Illič-Svityč 1964:4, 11, note 35). Comparing the Indo-European word to its Semitic source gives grounds for positing a still earlier archetype ***Heghono-** for Proto-Indo-European, with an initial laryngeal ***H-** equivalent to the Semitic ***c-**. The Indo-European ***-n-** in place of Semitic ***-l-** can be explained by absorption of this word into the large Indo-European class of domesticated animals with ***-n-** suffix (cf. also the alternation of ***-n-** and ***-l-** in forms such as Lat. *asinus* : OCS *osilŭ* 'donkey'; see II.3.1.2.1).

PIE ***qhe/oph-** 'monkey, ape' : Semitic forms Akkad. *uḫūpu*, Hebr. *ḵôṗ*, Aram. *ḵôṗā* 'monkey, ape' (beside Egypt. *gjf* 'monkey, ape'): von Soden 1981:III.1427. The pharyngealized (emphatic) ***ḵ** of the Semitic form is replaced in Indo-European by a postvelar which yields the regular reflexes in the historical languages (see I.2.4.6).

PIE ***bhar(s)-** 'grain, groats' : Sem. ***burr-/barr-** 'grain, threshed grain': Hebr. *bar* 'threshed grain', Arab. *burr-* 'wheat', S.Arab. (Soqotri) *bor*, (Mehri) *barr* 'grain, wheat' (Hrozný 1913:38; see Möller 1911:34, Illič-Svityč 1964:4-5, Fronzaroli 1969:VI.296, 1973:21-22, D. Cohen 1976:87). The borrowed nature of the word in Indo-European is shown by the ***a** root vocalism. In Indo-European this is a regional word, restricted to the Ancient European dialects: Lat. *far*, gen. *farris* 'spelt' (*Triticum spelta*), Osc., Umbr. *far*, Goth. *barizeins* 'made of barley', *kríthinos*, OIcel. *barr* 'grain, barley', OE *bære* (Engl. *barley*), cf. OIr. *bairen* 'bread', Serbo-Cr. *bâr* 'type of millet': see Porzig 1954:109 [1964:164-65]. The areal restriction of the word in Indo-European shows that it was borrowed into a specific dialect grouping, the one that later yielded the Ancient European dialects (Italic, Celtic, Germanic, Slavic) and must have originally been in contact with Semitic in some part of the Near East.

PIE ***dhoHnā-** 'grain, bread' (Skt. *dhānā-* 'grain crops', Pers. *dāna* 'grain, millet', Lith. *dúona* 'bread', Toch. B *tāno* 'grain': Van Windekens 1976:497) : Sem. ***duḥn-** 'millet' (see Fronzaroli 1969:VI.297): Akkad. *duḥnu*, Hebr. *dōḥan*, Aram. *dōḥinā*, Arab. *duḥn-* (see Hrozný 1913:33, Illič-Svityč 1964:5). This is a dialectally restricted word in Indo-European, found only in the Aryan-Tocharian-Baltic grouping. Upon borrowing into Indo-European dialects the Semitic velar spirant ***ḥ** is replaced by the laryngeal ***H**, which is responsible for the long ***ō** of the historical dialects; an alternative explanation would be loss of the foreign ***ḥ** in Indo-European with compensatory lengthening and no intermediate replacement of ***ḥ** by ***H**. Borrowing in the opposite direction, from Indo-European to Semitic, is less plausible since the replacement of Indo-European ***H** by Semitic ***ḥ** is hard to explain given the fact that Proto-Semitic had laryngeal and pharyngeal phonemes.

PIE ***Handh-** 'edible plant' (Skt. *āndha-* 'plant from which soma was made', Gk. *ánthos* 'flower', *ánthinon* · *eídar* 'vegetable food, lotus', Arm. *and* 'field') : Sem. ***ḥinṭ-(at-)** 'wheat, grains' (see Fronzaroli 1969:VI.297): Ugar. *ḥīt* 'wheat' (cf. Aistleitner 1963:101), Akkad. (Babyl.) *uṣṣetu* 'barley grain', (Assyr.) *uṣṣutu* 'grain crops; grain', Hebr. *ḥittā* 'wheat', Aram. *ḥittēṭā* 'wheat', Arab. *ḥinṭa* 'wheat', S.Arab. (Soqotri) *ḥinṭeh*, (Mehri) *ḥeyṭ* 'wheat' (see Möller 1911:10, Illič-Svityč 1964:4). The Indo-European word is restricted to the Greek-Armenian-Aryan dialect area and testifies to contact between this dialect group and the Semitic linguistic world in some part of the Near East. Note that the Semitic emphatic (pharyngealized or glottalized) ***ṭ** is rendered with the Indo-European voiced aspirate ***dh**. It must be assumed that in a number of Semitic dialects this sound was already perceived as voiced in ancient times (see Illič-Svityč 1964:10).

PIE ***k'oern-** 'millstone' : Sem. ***gurn-** 'threshing floor': Ugar. *grn* 'threshing floor; law court', Akkad. *maḡ/grattu* 'threshing floor; place of judgment', Hebr. *gōren* 'threshing floor', Arab. *ḡarana* 'grind', *ḡurn-* 'threshing

floor', (dial.) 'mortar': see Möller 1911:99-100, Illič-Svityč 1964:5. That the direction of borrowing was from Semitic to Indo-European and not the reverse can be established from the fact that the root is motivated in Semitic, where there is a verbal form as well as a nominal one.

PIE ***medhu-** 'honey; beverage made from honey' : Sem. ***mVtk-** 'sweet'(?): Akkad. *matku* 'sweet; plant yielding sweet sap', Ugar. *mtk* 'sweet', Hebr. *m-t-k* 'be sweet', *mātoḵ* 'sweet', Aram. *meṭaḵ*, Geez *metūk* 'sweet' (see Möller 1911:157, Illič-Svityč 1964:5). Since the Semitic root ***m-t-k** is productive as both a verb and a noun, the word can be regarded as native to Semitic and borrowed into Proto-Indo-European. The phonetically complex cluster ***-tk-** of Semitic is rendered in Indo-European with the single voiced aspirate ***dh-**. In contrast to the native Indo-European word for bee honey, ***meli(th-)**, the Semitic loan ***medhu-** began to be used in Indo-European to mean 'sweet intoxicating beverage'.

PIE ***phelekh-** 'poleaxe, axe' : Sem. ***p-l-k** 'split apart; axe': Akkad. *pilakku* 'axe', *pulluku* (Form II) 'kill (with an axe), chop', Syr. *pelkā* 'axe', Mand. *pīlkā* 'axe', Arab. *falaḵa* 'split apart': see Zimmern 1917:12, Wüst 1956:17-23 (with further references), Brockelmann 1966:576, Illič-Svityč 1964:6. The word has an unusual root structure not typical of native Indo-European forms. The Semitic word entered the Greek-(Armenian-)Aryan dialect group and subsequently underwent regular development in these dialects, showing the characteristic *satem* reflex of palatal ***k^h** in Indo-Iranian. The Semitic word could have entered the Greek-Aryan dialect grouping in some part of the Near East; see also II.6.5.14 above.

PIE ***sekhūr-** 'axe, poleaxe' (Lat. *secūris* 'axe, battleaxe', OCS *sekyra* 'axe, battleaxe') : Semitic forms Akkad. *šukurru* 'javelin' (loan from Sumerian(?): see von Soden 1981:III.1266), Hebr. *seḡōr* 'axe': Georgiev 1953, see also Vasmer 1953:-II.603 [1964-1973:III.593], Pohl 1977:15-16. In Indo-European the word is restricted to the Ancient European area; it must have been borrowed from Semitic while the speakers of these dialects were still in the Near East. It is interesting that two ancient Indo-European dialect words for a specific type of weapon, ***phelekh-** and ***sekhūr-**, were borrowed from a Semitic source, evidently in some part of ancient Southwest Asia.

PIE ***khlāHw-** 'lock, close; key' (Gk. (Dor.) *klāís* 'key', Lith. *kliūti* 'hit (target, etc.), get stuck', OCS *ključī* 'key', Lat. *clāuis* 'key', *claudō* '(I) lock', OIr. *cló* 'nail') : Sem. ***k-l-** 'hold back, restrain, detain; lock': Akkad. *kalū* 'restrain, detain', Hebr. *kālā* 'make obstacle, lock', *kele* 'jail', Aram. *kelā* 'make obstacle', Arab. *kala'a* 'guard', Geez *k-l-* 'lock, restrain' (Möller 1911:133, Illič-Svityč 1964:6). Indo-European ***H** is a reflex of the Semitic laryngeal ***'**.

PIE ***naHw-** 'ship, vessel' : Sem. ***'unw-(at-)** 'vessel', in West Semitic also 'ship' (see Fronzaroli 1971:VII.627): Akkad. *unūtu* 'vessel', Ugar. *'anyt* 'ship',

Hebr. *'onî* 'fleet', *'oniyyā* 'ship', Aram. *mānā* 'vessel', Arab. *'inā*-, Geez *newāy* 'vessel' (Illič-Svityč 1964:6). In Indo-European the initial undergoes metathesis and the laryngeal lengthens the root vowel.

PIE **khor(e)i-* 'buy, trade, barter' : Sem. **k-r-y* 'trade, barter': Hebr. *kārā* 'barter', *kîrā* 'a purchase', Arab. *k-r-y* 'rent out, let', *kirā*- 'rent', S.Arab. *'kry* (pl.) 'lease payment' (see Möller 1911:141-42, Illič-Svityč 1964:6).

PIE **t'aph-* 'sacrifice' : Sem. **-d̥baḥ-* 'offer as sacrifice; split', **dibḥ-* 'sacrifice, sacrificial animal' (see Fronzaroli 1965:IV.255): Akkad. *zibu* 'sacrifice, offering', Ugar. *dbḥ* 'sacrifice', *mdbḥ* 'altar', Hebr. *zebāḥ* 'sacrificial animal', *zāḥāḥ* 'offer in sacrifice', *mizbēdāḥ* 'altar', Syr. *deḥā* 'sacrifice', Arab. *ḍabaḥa* 'offer as sacrifice', *ḍibḥ-* 'offering, sacrifice' (see Möller 1911:44-45, Illič-Svityč 1964:6). That the Indo-European word is a borrowing is shown by its foreign accessive consonant sequence and root vowel **a*.

PIE **Hasther-* 'star' : Sem. **caṭtar-* 'deified star; planet Venus': Akkad. *Ištar* 'goddess Ishtar', Hebr. *caštōreṭ*, Phoen. *cšrt* 'goddess Astarte', Aram. *ctr*, S.Arab. *citr* (Henninger 1976). The Indo-European initial laryngeal, reflected in Hittite as *ḫ-* (*ḫaster-* 'star'), takes the place of the Semitic pharyngeal **c* in this borrowed word; for more on these words see II.5.5.4 above.¹⁴

PIE **sephthm̥* 'seven' : Sem. **sabc-* 'seven', fem. **sabc-at-*: Akkad. *seba*, fem. *sebettu*, Hebr. *šēbac*, *šibcā*, Aram. *šēbac*, *šibcā*, Arab. *sabc-*, fem. *sabc-at-*, Geez *sabcū*, *sabcatū* (see Möller 1911:227, Illič-Svityč 1964:7). The numeral 'seven' entered Proto-Indo-European in the feminine form with the function of an abstract noun ('a seven'), with the Semitic ending **-t-* to which was added the Indo-European suffix **-m̥*. There is an interesting analogous borrowing of Semitic 'seven' in the feminine form into Proto-Kartvelian, as **šwid-* (with spirantization of the Semitic stop *-b-*: see Illič-Svityč 1964:7, Klimov 1967a). Borrowing of numerals, especially those higher than five, is a widespread phenomenon attested in many languages and can be explained by particularly close contact and cultural interaction.

Semitic words containing pharyngeal and laryngeal consonants are borrowed into Proto-Indo-European with Indo-European laryngeals. The borrowed words subsequently undergo normal phonological development in the Indo-European dialects, i.e. the laryngeals in these words behave the same as native laryngeals.

Borrowing in the opposite direction, from Indo-European to Semitic, is also

14. The reconstructed Proto-Semitic word **caṭtar-* 'astral deity; deified morning star', which coincides in form and content with Indo-European **Hasther-*, cannot be etymologized in Semitic. Therefore the connection of these two forms, usually explained as a borrowing from Semitic into Proto-Indo-European, could equally well be interpreted as a borrowing in the opposite direction, from Indo-European to Semitic. Such a direction is plausible, since the word can be analyzed in terms of Indo-European word formation (root **Has-* and the widely attested Indo-European derivational suffix **-t̥her-*) and since a semantic shift from general ('star') to more particular ('deified star') is plausible.

observed. One such example is Sem. **karn-* 'horn': Akkad. *ḫarnu*, Ugar. *ḫrn*, Hebr. *ḳeren*, Arab. *ḳarn-*, which continue the Indo-European derived form **k̑h₂r-n-* 'horn': Lat. *cornū*, Goth. *haúrn*, OE, Engl. *horn*, OHG *horn* (Ger. *Horn*), cf. also Latv. *sirna* 'chamois, roe deer', Skt. *śṛṅga-* 'horn'. The Semitic word is of Indo-European origin and not vice versa, as can be concluded from the fact that the Indo-European stem is derived from the root **k̑her-* 'top, head', Hom. Gk. *kár*, etc. (See also just above and note 14 for Sem. **caṭtar-* and PIE **Hasther-* 'star'.)

There are also Proto-Indo-European–Egyptian lexical links: PIE **bhei-* 'bee': Egypt. *bj.t* 'bee'. The comparison is particularly significant, since the Near East was an ancient center of honeybee domestication, which in Egypt is dated to a time no later than the third millennium B.C. (see II.3.2.5.6). The word could have entered Proto-Indo-European only in the Near East under conditions where contacts with Egyptian were possible.

Further evidence for a Near Eastern center of dispersal for Proto-Indo-European is a number of lexical borrowings into Proto-Indo-European from Sumerian, which was spoken in the fourth millennium B.C. in Mesopotamia:

PIE **k'oou-* 'bull, cow': Sum. *ḡu[d]* (= *gud*, *gu*) 'bull', cf. Egypt. *ng3w* 'type of large bull' (see Ipsen 1923:175ff. and II.3.1.3.6 above).

PIE **r(e)udh-* 'ore, copper, red': Sum. *urudu* (J. Schmidt 1890; for more on the Indo-European–Sumerian connection see II.6.5.9 above). The word is of particular significance for confirming the connection of Proto-Indo-European metallurgy with that of the ancient East (for the chronology of Mesopotamian metallurgy see Merpert and Munčaeu 1977, Desch et al. 1928–1936).

PIE **(a)wes(kh)-* 'gold': Sum. *guškin* (see II.6.5.11 above). The same ultimately Sumerian migratory term is found (sometimes with a semantic development from 'gold' to 'copper') in a number of other language families: Uralic (Aalto 1959, Ivanov 1976:85), Daghestanian (with probable *m-* from **w-*: Avar *mesed*, Andi *misidi*, Akhvakh *mišidi*, Dargi *murhi*, Lak *musi*, Archi *misir-ttu* (< **misid-ttu*), Udi *mis*, Xinalug *mis* 'copper': see Gudava 1964a:83, Giginješvili 1977:26, 119). Historically, gold metallurgy is dated to the same period as may have provided the word for 'copper'.

PIE **ak̑ro-* 'field, grainfield': Sum. *agar* (= *a.gár*) 'irrigated territory; grainfield' (Schott 1936:83, Devoto 1962:37). This pair of words may be evidence for a connection of Indo-European agriculture with methods of working the land in Sumer.

PIE **d̑wer-* 'yard, door': Sum. *tùr* 'yard; cattle yard; enclosure for cattle' (Schott 1936:83).

PIE **H(e/o)k'or-* 'mountaintop': Sum. *kúr* 'mountain, mountainous country'.

11.3.3. Kartvelian–Indo-European lexical links at the protolanguage level

The same kind of interpretation is to be given to borrowed Indo-European vocabulary in Proto-Kartvelian (South Caucasian). Proto-Indo-European, or in any case some of its ancient dialect groupings, was in contact with Proto-Kartvelian in some part of the Near East. Kartvelian words that can be recognized as Indo-European in origin include the following.

Kartv. **uγ-el-* ‘yoke’: Geo. *uγel-* ‘yoke’, Mingr. *uγu*, Svan *ūγwa* ‘yoke’: PIE **yuk’-om* ‘yoke’ (see Klimov 1964:186).

Kartv. **e-šw-* ‘boar, pig’: Geo. *ešw-* ‘tusk’, Mingr. *o-sk-u* ‘pigsty’ (Klimov 1964:81): PIE **sũ-* ‘pig’.¹⁵

Kartv. **mat’l’-* ‘worm’: Geo. *mat’l-*, Mingr.-Laz *munt’ur-*, Svan *mət’*: PIE **math-/ *moth-* ‘stinging insect; worm’ (Djahukian 1967a:93): Arm. *mat’il* ‘louse’, Goth. *maþa*, OHG *mado* (Ger. *Motte*), OE *maða* ‘worm’ (Pokorny 1959:700).¹⁶

Kartv. **dqa-* ‘goat’: Geo. *txa*, Mingr.-Laz *txa*, Svan *daq-*: IE dial. **t’igh-* ‘goat’ (see Klimov 1964:77).

Kartv. **diqa-* ‘clay’: OGeo. *tiqa-*, Geo. *tixa* ‘clay, mud’, Mingr. *dixa*, *dexa* ‘soil, earth, place’, Laz *(n)dixa*: PIE **dheǵh-om-* ‘earth’ (Klimov 1964:95); cf. also Svan *gim* ‘earth’ beside IE dial. **ǵhem-* ‘earth, soil’, from **dhǵhem-*.

Kartv. **dew-/ *dw-* ‘lie; put, lay’: Geo. *dew-/dw-*, Mingr. *d(w)-*, Laz *d(w)-*, Svan *d-*: PIE **dheH-* ‘put, lay’.

Kartv. **lag-/ *lg-* ‘put, lay; plant’: Geo. *lag-* ‘put’, *rg-* ‘plant’, Mingr. *rg-*, Laz *rg-*, Svan *laž-/lž-*: PIE **legħ-* ‘lie’ (Vogt 1938:337).

Kartv. **den-/ *din-* ‘flow’, **dṇ-* ‘melt’: Geo. *den-/din-* ‘flow’, *dn-* ‘melt’, Mingr. *dən-*, *din-* ‘disappear; lose, get lost’, Laz *din-*, *(n)dun-*, Svan *n-* ‘melt’: PIE **dhen-* ‘run, flow’ (see Andronikašvili 1966:85).

Kartv. **gen-/ *gn-* ‘hear, understand, be aware’: Geo. *gen-/gn-*, Mingr. *gən-/gin-*, Laz *gn-*; Kartv. **gon-* ‘think, remember’: Geo. *gon-*, Mingr. *gon-*, Laz *(n)gon-*: PIE **k̑en-/ *k̑n-* ‘know, apprehend’ (Klimov 1964:63–64).

Kartv. **zisxl-* ‘blood’: Geo. *sisxl-*, Mingr. *zisxir-*, Laz *dicxir-*, Svan *zisx*: PIE **esH-r̥-* ‘blood’ (see Klimov 1964:87). The borrowed Kartvelian form shows reduplication with voicing of the root **s-*, a typical reduplication for Kartvelian.

15. A dialectal (Georgian-Zan) Kartvelian word for ‘pig’, **γor-* (Geo. *γor-*, Mingr.-Laz *yež-*), may be connected to Indo-European dialectal **ǵhoryo-* ‘pig’: Gk. *khoĩros* ‘piglet’, cf. also Alb. *derr* ‘pig’ (from **ǵhōr-n-*), *derkúc* ‘piglet’ (from **ǵhōr-ṇ-kh-*: Pokorny 1959:445); see Djahukian 1967a:100.

16. If Kartv. **mat’l’-* is to be analyzed as **ma-t’l’-* (with prefixal **ma-/ *ṁ-* and the root **t’l’-* ‘decay, rot’ of Geo. *t’l-ob-a-* ‘rot, decay’), the Kartvelian word could be linked to PIE **thaH-l-/ *thH-l-*, which has a number of Slavic correspondences: OCS *tlěti* ‘rot, decay’, *tlja* (noun), cf. Russ. *itlenie* ‘rotting, decay’, *tlja* ‘aphids’ (see Šardžveladze 1980).

Kartv. **m-k'erd-* 'chest': Geo. *mk'erd-*, Mingr. *k'idir-*, Svan *məč'wed*, *muč'od* : PIE **k̑hert-* 'heart' (see Čikobava 1942:99). The Indo-European glottalized **t'* is reflected in Georgian as a voiced **d* due to dissimilative voicing (caused by a rule prohibiting the occurrence of two glottalized consonants in a single root). For the semantic change from Indo-European 'heart' to Kartvelian 'chest' cf. the meaning 'chest' of Geo. *gul-* 'heart' in the compound *gul-mk'erd-i* 'chest'.

Kartv. **up'e/op'a* 'navel': Geo. *up'e* 'navel', Laz *omp'a*, *ump'a* 'navel', Mingr. *omp'a* 'uppermost beam of roof' : PIE **ombh-* 'navel' (see Marr 1910a:192, Klimov 1964:186).

Kartv. **km-ar-/km-ṛ-*: Geo. *kmār-i* 'husband', Mingr. *komonž-i*, Laz *komož-i* id. : Gk. *gambrós* 'affinal relative; daughter's husband, wife's brother', Skt. *jāmātar-*, Avest. *zāmātar-* 'daughter's husband'; cf. also Gk. *gamēō* '(I) get married', Hom. *gámos* 'wedding, marriage' (see Djahukian 1967a:77).

Kartv. **šw-* 'give birth, be born': Geo. *šw-* 'give birth, be born', cf. *šv-il-i* 'son', *p'ir-mšo-* 'first-born' from **p'irmšwe-* (cf. Skt. *pūrva-sū-* 'first-born'), Mingr. *skw-* 'lay egg' (of bird) (cf. *skua* 'son'), Svan *sg-* 'give birth, be born', cf. *əmsge* 'son' : PIE **seu-* 'give birth, be born' (Bopp 1847:43, 74; cf. Dondua 1975:235).

Kartv. **ber-* 'blow, inflate': Geo. *ber-*, Mingr. *bar-*, Laz *bar-*, Svan *bēl-* 'blow; have gas' : PIE **bhel-* 'blow, inflate' (Lat. *follis* 'bellows', OIcel. *bollr* 'ball').

Kartv. **k'rep-* 'gather (fruits, flowers)': Geo. *k'rep-/k'rip-* 'gather (fruits, flowers)', Mingr. *k'orop-*; Kartv. **k'reb-/k'erb-/k'ṛb-* 'collect, gather, assemble': Geo. *k'erb-/k'reb-/k'rib-*, Mingr.-Laz *k'orob-* : PIE **k̑herph-* 'gather (harvest, fruit)': Lat. *carpō* '(I) pluck', Gk. *karpós* 'fruit', OE *hærfest*, Engl. *harvest*, OHG *herbist*, Ger. *Herbst* 'autumn' (see Djahukian 1967a:69).

Kartv. **ekšw-* 'six': Geo. *ekws-*, Mingr. *amšv-*, Laz *a(n)š-*, Svan *usgwa* 'six' : PIE **ṣoek̑hs-* 'six' (see Bopp 1847:38). Borrowing of 'six' in Kartvelian becomes more plausible in view of the Semitic origin of 'seven', **šwid-* (see 11.3.2), and 'eight', **ṛwa-/arwa-* (see Klimov 1967a).

Another borrowed numeral in Kartvelian is *(*o*)*ṣtx(o)-* 'four': Geo. *otx-*, Mingr. *otx-*, Laz *otxu*, *o(n)txo*, Svan *woštxw* : PIE **ok̑hth(o)-* 'four fingers' (see II.10.3.5): see Bopp 1847:37, Klimov 1977a. Metathesis of **k̑hth* to **thk̑h*, with subsequent spirantization of **k̑h* and assibilation of the first element of the cluster, must be posited for the borrowed Kartvelian form.

Kartv. **k'b-en-/k'b-in-* 'bite', **k'b-il-* 'tooth': Geo. *k'ben-/k'bin-*, Mingr. *k'ibir-*, Laz *k'ibin-* 'bite'; Geo. *k'bil-* 'tooth', Mingr. *k'ibir-*, Laz *k'ibi(r)-*, *k'ibr-* 'tooth' : PIE **k̑ebh-/k̑eph-* 'jaw, mouth; eat, devour'; the same root also has a nasalized form **k̑embh-/k̑m̑bh-* 'bite', **k̑ombho-* 'tooth' (Pokorný 1959:369, 382): Toch. A *kam*, B *keme* 'tooth', Skt. *jāmbha-* 'tooth', Gk. *gómphos* 'thorn, stake', OCS *zqbŭ* 'tooth' (see Djahukian 1967a:81).

Kartv. **bɾg-* 'strong, high, large': Geo. *brge* 'high, imposing (of man)', Svan *bag-i* 'strong' (Gamkrelidze and Mačavariani 1965:99) : PIE **bherǵh-* / **bhrǵh-* 'high, large, strong': Hitt. *parku-* 'high', Skt. *bṛhánt-* 'large, high, glorious, strong', OLat. *fortus* 'strong, brave', Arm. *barj* 'high'.

Kartv. **t'ep-/t'p-* 'get warm, make warm; warm': Geo. *t'ep-*, *t'p-* 'get warm, make warm', *t'p-il-i* 'warm', Mingr. *t'əbu*, *t'ibu*, Laz *t'ibu*, *t'ubu* 'warm', Svan *t'ebdi* : PIE **tʰepʰ-* 'warm' (see Bopp 1847:25, 75; also Dondua 1975:236). The Indo-European word shows anomalous root structure with an accessive consonant sequence (see I.2.6.3 and I.2.6.3n70).¹⁷

These Kartvelian-Indo-European lexical sets exhibit a strikingly broad semantic spectrum, including not only cultural terms but also a number of basic vocabulary items: 'give birth', body parts, and so on. This points to especially close contact of these two languages within a linguistic area, which also accounts for the structural isomorphism established between Indo-European and Kartvelian (see Melikišvili 1970:335ff.).

Some of the alternations observed in the reflexes of Indo-European phonemes in their borrowed Kartvelian counterparts are evidently due to different times of borrowing. For instance, rendition of Indo-European glottalized consonants as voiced in a number of Kartvelian forms (e.g. Kartv. **gen-/gn-* from PIE **ǵen-/ǵn-*) is due to borrowing of these forms from some ancient Indo-European dialect that had already voiced the glottalized series.¹⁸

17. PIE **tʰepʰ-* with its accessive consonantism is an exception to the root structure canon and should probably be considered a loan in Indo-European (see above for PIE **t'apʰ-*, with analogous root structure, as a loan from Semitic). It cannot be ruled out that the root is of foreign origin, in this case probably from Kartvelian, where the protoform **t'ep-* has entirely normal Kartvelian structure.

18. In addition to the Proto-Kartvelian forms with Proto-Indo-European correspondents, the Kartvelian languages also have words bearing similarities to dialect words in Indo-European, in particular Italic and Balto-Slavic (Ancient European):

Kartv. **k'wad-/k'ud-* (Geo. *k'ud-*, Mingr.-Laz *k'udel-*, Svan *ha-k'wäd* 'tail') beside Lat. *cauda* 'tail' (of unknown etymology; Ernout and Meillet 1967:106); see Djahukian 1967a:100.

Kartv. **k'rk'o-* 'acorn' (Geo. *rk'o*, dial. *k'urk'o*, *girk'o*, Mingr. *k'ə*, *k'i*; cf. also the related Geo. *k'urk'a* 'pit, seed in fruit' beside Tush dial. *k'urk'o* 'acorn') beside PIE **pʰerkʰo-* (Italic **querqu-*: Lat. *quercus* 'oak', Venet. *Quarquēni*): see Šanidze 1947.

Geo. *zuk'na* 'bitch' (probably *zu-* 'female' + **k'n-a* 'dog'): cf. Lat. *canis* 'dog', Illyr. *Can-*, PIE **kʰwen-/kʰwon-* (see Melikišvili 1965a).

Geo. *bosel-* 'cattle shed', comparable to Italic forms such as Lat. *bōs* 'bull' (from PIE **kʰoou-*); the Georgian form can then be etymologized as *bos-el-* 'place for livestock' (see Djahukian 1967a:85).

Kartv. **k'wenɾ-* 'marten': Geo. *k'werna-*, Mingr. *k'unor-*, Laz *k'wenu(r)*, Svan *rk'wen*, *k'(w)en-* beside the Balto-Slavic word for 'marten': Lith. *kiaunė*, Latv. *caūna*, OPruss. *caune*, ORuss. *kuna* (see Djahukian 1967a:100).

Kartv. **ɾka-* 'horn': Geo. *rka*, Mingr. *ka*, Laz *kra* beside Balto-Slavic 'horn': Lith. *rāgas*, Latv. *rags*, OPruss. *ragis*, OCS *rogŭ* 'horn' (see Djahukian 1967a:100).

11.3.4. *The correlation of the Proto-Indo-European, Proto-Semitic, and Proto-Kartvelian linguistic systems in time and space*

The areal contacts of Proto-Indo-European with Semitic and Kartvelian indicated by lexical borrowings fit well the temporal and areal distribution of Semitic and Kartvelian.

Proto-Semitic dates to no later than the fourth millennium B.C. The discovery of Eblaite, a new, previously unknown Semitic language (Paleo-Canaanite) spoken in ancient Ebla (*Eb-la^{KI}*, modern Tell Mardikh in northern Syria) in the mid-third millennium B.C. (before the time of Sargon of Akkad, ca. 2350-2250 B.C.), which has proven to be a distinct dialect of Semitic sharing a number of linguistic features with both West and East Semitic (Pettinato 1975, Gelb 1977), justifies dating the breakup of Proto-Semitic to no later than the fourth millennium B.C., which coincides chronologically with Proto-Indo-European. The territory of Proto-Semitic must have been some part of the Near East where contacts with Proto-Indo-European and Proto-Kartvelian could have taken place.¹⁹ (On the Near Eastern homeland of the Semitic peoples see Grintz 1962.)

11.3.5. *Lexical connections between Proto-Indo-European and the ancient languages of Southwest Asia (Hattic, Elamite, Hurrian-Urartean)*

Proto-Indo-European also shows evidence of lexical contacts with other ancient languages of the Near East: Sumerian (see 11.3.2 above), Elamite, and

19. Proto-Kartvelian (South Caucasian) dates to the fourth to third millennia B.C. Glottochronological evidence puts the beginning of its differentiation in the very early second millennium B.C. (and possibly much earlier), at which time Svan separated out and Proto-Kartvelian divided into two separate areas, Svan and Georgian-Zan, the latter subsequently splitting into Georgian and Zan (or Colchidian): see Gamkrelidze and Mačavariani 1965:17.

Proto-Kartvelian prior to its breakup must be placed, on the evidence of archaic lexical and toponymic data, in the mountainous regions of the western and central part of the Little Caucasus (the Transcaucasian foothills). The first wave of Kartvelian migrations to the west and northwest, in the direction of the Colchidian plains, must have begun with one of the western dialects in the third millennium B.C. and led to the formation of Svan, which spread to the western Transcaucasus and was superimposed on local languages, probably of the Northwest Caucasian type, which thus became substratal to Svan. Svan was gradually displaced to the north, to the Great Caucasus range, by the next wave of migrations, which occurred approximately nine centuries later (on glottochronological evidence) and removed the westernmost remaining dialect as far as the Black Sea coast. This western dialect gave rise to the later Colchidian — or Zan, or Mingrelian-Laz — language, one of the languages of ancient Colchis.

The dialects which remained in the ancient Kartvelian homeland underlie Georgian. In historical times, speakers of Georgian spread to the west, to part of the Colchidian territory, splitting the Colchidian language into two dialects and setting up the development of Mingrelian and Laz (Chan) into independent languages. They also spread to the north and northeast, displacing languages of the Northeast Caucasian type.

These Kartvelian migrations triggered the breakup of Proto-Kartvelian and the expansion of its dialects beyond the original territory.

Hattic, which have a number of lexemes of common origin. The prime example involves words pertaining to wine — words clearly of Indo-European origin which entered a wide range of Near Eastern languages.

PIE **we/oi-no-* 'wine': Sem. **wayn-*: Akkad. *īnu*, Ugar. *yn*, Hebr. *yayin*, Arab. *wayn-* 'black grape', S. Arab. *wyn* 'wine', Geez *wayn* 'grape; wine' (Möller 1911:214, Illič-Svityč 1964:5); cf. Egypt. *wnš* 'edible fruit; grape; wine', *wnš.t* 'wine': Kartv. **ɣwino-*: Geo. *ɣwin-*, Laz (ɣ)*win-*, Svan *ɣvināl*²⁰ (see Bopp 1847:28): Hatt. *windu-kkaram* 'wine steward' (see II.4.2.1.2 above).

PIE **šaml-* 'apple': Kartv. **wašl-* 'apple': Geo. *wašl-*, Mingr. *uškur-*, Laz *oškur-*, *uškur-*, Svan *wisk'w/usk'w*: Hatt. *šawat* (**šawal*). The words can be regarded as of common origin, although the source cannot be established with certainty. Any of the forms cited above could have been the source form (see II.4.1.12.4).

The forms discussed so far can serve as an orientation for establishing the approximate boundaries of the original Indo-European territory in terms of possible contacts with languages of Southwest Asia, such as Semitic, Kartvelian, Hattic.

A Hattic word in Indo-European is evidently **phars-/phart-* 'panther, leopard': cf. Hatt. (*ha-*)*parš-* 'panther' (see II.2.1.3.7).

On the other hand, Hattic has some words of Indo-European provenience which are earlier than possible Hittite-Luwian loans:

Hatt. *aya/iya/ya-* 'give'²¹ (Kammenhuber 1969:453, 487, 526). The word is a loan of Indo-European **ai-*: Toch. B *ai-* 'give', Toch. A *e-*, Gk. *aísa* 'lot', *aínumai* '(I) take', Lat. *ae-mulus* 'rival', Hitt. *p-ai-*, *p-iya-* 'give' (Pokorny 1959:10-11; cf. Van Windekens 1976:174). The word is borrowed from an early Indo-European dialect, possibly from Common Indo-European itself or from some regional dialect grouping other than Anatolian. It could not have come from Anatolian, since this Indo-European root was already prefixed with **ph-* in Proto-Anatolian: Hitt. *pai-*, Luw. *piya-*, Hier. Luw. *pia-*, Pal. *piša-*; reduplication in Luw. *pipišša-*, Lyc. *pibije-* 'give' (Laroche 1973:94-95), Lyd. *bi-*.

Hatt. *u-ra-i* 'spring' (translated in bilinguals with the Sumerian logogram TÚL), *DÚ-ri-e-it* 'goddess of waters and springs' (Kammenhuber 1969:462); an ancient Indo-European loan, cf. PIE **wer-* 'water': Toch. A *wār*, B *war* 'water', Skt. *vār-* 'water', *vāri* 'water, rain', Avest. *vairi-* 'sea', Alb. *hurdhë* 'pond', Oícel. *vari* 'water'. The word cannot have been borrowed from Anatolian because its stem is absent in that stock.

20. Cf. also correspondences in the word for 'grapevine': Geo. *venaq-*, Mingr.-Laz *binex-* beside ancient dialectal Indo-European **weinak-*: OCS *vinjaga*, see II.4.2.1.2n62.

21. A Hittite-Hattic bilingual, KUB II 2+ §I II 40/43, has: Hatt. *ya-e i-malhip* beside Hitt. *na-aš-si pí-we-ni SIG₅-an-du-uš NA₄H^{1A}* 'and we give him good stones'; KUB XXVIII 80 I 8': *taš-te-ya-ya* 'may [he] not give him/her', *aya tabarna katte-ya* 'they should give to the ruler, the king' (Kammenhuber 1969:508, 526). In bilinguals the Hattic verb is translated with Hitt. *pai-*, *piya-* 'give'.

Similar Indo-European loans are found in another ancient language of the Near East, Elamite. In addition to Anatolian loans such as Elam. *api(e)* (anaphoric pronoun), *akka* 'which', *pini* 'gift, dedication', etc. (cf. Hitt. *apa-* 'this', *ka-* 'that', *pai-/piya-* 'give'), Elamite has forms of Indo-European origin which are distinct from Anatolian and evidently go back to an older source, possibly a dialect of Common Indo-European: Elam. *ta-* 'put, place, stand', *tatta-* id. (perfective) (cf. Skt. *dádāhāti* 'puts, stands', Gk. *títēmi*: PIE **dh̥eH-*), Elam. *baḥa* 'defense, defender' (cf. Skt. *pā-* 'defender, defend' beside Hitt. *paḥš-* 'defend': PIE **phaH-*), Elam. *luk-* 'fire' (cf. Lat. *lūx* 'light', Gk. *leukós* 'white, light-colored' beside Hitt. *lukatta* 'day breaks', exclusively verbal: PIE **l(e)ukh-*), Elam. *pari* 'go on campaign, march' (cf. Gk. *póros* 'passageway', Lat. *portus* 'harbor': PIE **phorH-*), and others (see Rosenkranz 1971).

Indo-European loans are also found in Hurrian and Urartean, pointing to ancient links of these languages with Indo-European dialects and possibly Proto-Indo-European. Given the analogous loans in Hattic and Elamite, contact of Proto-Indo-European with Hurrian-Urartean is entirely possible. Hurr.-Ur. *ag-* 'lead': PIE **aḱ-* 'lead'; Hurr. *ašš-* 'sit', Ur. *aš-* 'sit': PIE **es-* 'sit, be seated'; Ur. *pari/e* 'up to, toward': PIE **phr-i-*; Ur. *burgana-* 'fortress': PIE **bhr̥gḥ-*; Ur. *gunu-še* 'battle, war': PIE **gho(e)n-* 'break, strike; battle' (see Diakonoff 1971:82, Djahukian 1967a).

Among the cultural terms common to Indo-European, Hattic, and Hurrian and evidently borrowed from Indo-European into adjacent Hattic and Hurrian may also be a word for 'grain': PIE **Hat-* 'grain' (see II.4.2.2.1) beside Hatt. *kait* 'grain; goddess of grain' (Kammenhuber 1969:460-61), Hurr. *kad/te* 'barley; grain' (Laroche 1978:133, Haas, Thiel, et al. 1975:23).²²

The presence of a common word for 'grain' in Proto-Indo-European, Hattic, and Hurrian would be consistent with the claim that agriculture and the cultivation of particular grains developed in the range of Proto-Indo-European and that this was close to the territory of Hattic and Hurrian.

11.4. Indo-European culture in typological comparison to ancient Oriental civilizations

11.4.1. The level of Indo-European material and intellectual culture as an indicator of proximity to ancient Near Eastern centers of civilization

The analysis of the Indo-European lexicon and text semantics given above

22. PIE **Hat-* and Hattic-Hurrian *ka(i)t* are identical in sense and present no formal problems for comparison. Indo-European initial **H-* could have been rendered by an alternating *h/k* upon borrowing into Hattic or Hurrian. Alternation of *k* and *h* is attested in both Hattic (Hatt. *Kataḥḥa*, *Ḥataḡga*, *Ḥataḥḥa* 'queen') and Hurrian (Hurr. *kešḥi*, *keški*, *ḥešḥi* 'throne': see Diakonoff 1971:50).

permits reconstruction of the culture and social relations of the society that spoke Proto-Indo-European. The entire character of Proto-Indo-European culture and social relations points to proximity to ancient oriental civilizations. This can serve as an additional argument in favor of a Near Eastern site for the Indo-European homeland, a site where Proto-Indo-European culture formed and developed in close contact and interaction with the cultures of the ancient Near East.

The Proto-Indo-European lexicon and reconstructed text fragments establish a relatively high degree of material culture. Not only herding but also agriculture played a significant role, and their products were used in such crafts as weaving (**khes-* and **phekḥ-* 'comb wool', **Hwln-* 'wool', **H(o)u-/Hwebh-* 'weave', **sneH-* 'spin', **syu(H)-* 'sew'; **lino-* 'flax'). Familiarity with metals, in particular bronze, and metallurgy are attested. Craft production is well developed (**theḥs-* 'manufacture', **pheḥ-* 'plait, braid, weave', **ther-* 'rub, abrade, polish; drill', **bher-* 'work with sharp tool', **skher-* 'cut, shear, cut out', **t'er-* 'remove bark, skin'; also pottery terms: **dheigh-* 'clay; material for pottery making').

Specialized words can be reconstructed for various types of weapons (**ṇsi-/ensi-* 'sword'), as can a military lexicon (**ghoen-* 'kill, destroy', **se/orw-* and **lau-* 'booty; take plunder', etc.; **laH(w)o-* 'army, campaign', **wer-* 'defend'); wheeled transport technology is well developed.

A number of manifestations of relatively high intellectual activity can be reconstructed, in particular metric forms and poetic language. Ritual is revealed in an elaborate priestly terminology and mythology: **sphent-* 'perform libation', **t'aHph-* 'eat ritual food offered to a god', **Has-* 'hearth, altar', **kḥret-* **dheH-* 'believe, have faith', **sakh-* 'sanctify; sacred', **eisHro-* 'endowed with sacred force', **ayu-* 'life force, eternity', **Ḥner-th-* 'life force'. Ritual and legal terms include: **muk'-* 'pray', **arw-* 'pray, offer prayer', **naH-* 'consider true', **sāk'-* 'recognize by signs, omens', **Ho-* 'consider true', **yewo-* 'ritual law', **t'eikḥ-* 'predestination', **leik'-* 'impose, take on obligation', **serkh-* 'compensate, indemnify'.

Not only is the entire type of Indo-European mythology close to ancient Oriental mythological traditions, but the very motifs and images of the myths find their analogs in ancient Oriental mythologies, under whose influence the Proto-Indo-European mythological tradition must have taken shape. Examples include the mythologeme of the primordial unity of man and earth, the motif of a god as shepherd for the souls of the dead, mythic images of bulls and lions, the motif of stolen apples, and others mentioned above in connection with the individual traditions. Here we have to do with typological parallels and agreements that could only have come about under conditions of close interaction among different mythic traditions in a single culture area. Especially

revealing are those Indo-European rites that coincide with Oriental ones, in particular the burial of a leader in a chariot, culminating in cremation of the corpse and collection of the remains in special vessels (see II.9.3.6).

In the area of Proto-Indo-European socio-economic relations it is important to emphasize the existence of settlements (***weik̑h-**) with groups of houses (***t'om-**) enclosed within their boundaries (***e/orH-**) and fences (***gherdh-**). In the houses lived extended families, patriarchal in type as is evident from the kinship terminology. The typical fortified settlement was obviously located in a high place or on a cliff: ***phel-** 'fortified city', ***bhergh-** 'high (of a town or city)': see II.7.2.2.

Settlements are united into tribes and clans (***k̑'en-** and ***Hons-**) based on a dual-exogamous organizational principle that is consistent with the Omaha-Crow kinship system (for kinship terms and marriage relations see II.7.6 above) and with the existence of terms for wealth connected with exchange (***t'oH-** 'give, take', ***(n)em-** 'give, apportion, take', ***mei-** 'exchange, trade') and trade (***we/os-**, ***khoer-**), property and wealth (***Hoph-r/n-**, ***reH(i)-**), the poor or deprived of inheritance (***orbho-**), thieves (***(s)thaH-**), and the lexicalized opposition of free (***arwo-** 'free agriculturalist', ***leudhero-** 'free') to non-free.

Three (and in individual traditions sometimes four) social ranks are reconstructed for Proto-Indo-European society. They are correlated with symbolic and mythological classifications. The class of priests plays an essential role in the typological characterization of Proto-Indo-European society. There is a special word for the king (***rēk̑'-**), who was also the high priest, as in ancient Oriental civilizations (see II.8.2).

For the fifth to fourth millennia B.C., that is, in the period of Proto-Indo-European language and society prior to the beginning of the great migrations, this entire complex of cultural factors and socio-economic structure is characteristic of the early civilizations of the ancient Near East. Proto-Indo-European civilization belongs typologically to Near Eastern civilization.

In addition to the essential similarities among these civilizations, for which the office of the priesthood is characteristic, there are a number of mutually interconnected categories which are typologically important for developed Near Eastern cultures but which do not agree completely with the reconstructed data for Proto-Indo-European society of the fourth millennium B.C. Proto-Indo-European culture lacked writing, a centralized state power (PIE ***rēk̑'-** originally referred only to a sacral king), artificial irrigation, and a merchant class opposed to the other social ranks.

The reason for the lack of writing, despite the existence of a priesthood and a fairly high level of social organization, may have been that the economy had not yet attained the degree of development and elaboration that would require

accounting. There was no single state power over the entire society. Nor was there evidently any extensive system of artificial irrigation, which would presuppose centralized power; Egypt. *mr* 'canal, irrigation reservoir' enters individual Indo-European dialects only later: Hitt. *amiyara-* 'canal' in the Hittite Laws, Hom. Gk. *amárē* 'ditch, canal' (Iliad 21:259), *Amárunthos*, name of a place connected with the water supply for Eretria, Myc. Gk. *A-ma-ru-ta* (see Morpurgo 1963:16), cf. Alb. *âmë* 'channel of river'.

Had the Indo-Europeans had a centralized state organization of the sort connected with a culture fixed in writing, the extensive migrations of the Indo-European tribes from their original territory would not have occurred. The lack of centralized power must have facilitated the breakup of Proto-Indo-European unity and favored the independent development of the Indo-European dialects.²³

The migrations of speakers of the Indo-European dialects to their new territories could have involved gradual infiltration of the new ethnic element in relatively small groups, conquest of new territories and subjugation of the indigenous populations, or both. The speech of the migrating tribes, carried to their new territories, could have either merged with the local languages, leaving traces of its structure and lexicon as a superstratum in the surviving autochthonous languages, or displaced the indigenous languages to become the dominant language of the country. In cases of the latter sort, traces of the earlier languages of the indigenous population appear in the form of a substratum, which leaves an imprint — often an essential imprint — on the whole structure and lexicon of the dialects brought by the new settlers (see Schlerath 1973:21ff.). Substratal influence of this type can bring about significant alterations in the structure and sound inventory of the immigrants' dialect, distancing it considerably from its original structure. In

23. Furthermore, a characteristic feature in the migrations of tribes having agricultural (or agricultural and herding) economies is partial migration of individual groups, in contrast to the migrations of nomadic tribes, which move as a compact mass and abandon their former territory. According to N. I. Vavilov, intensive migrations are characteristic precisely of agricultural societies in mountainous regions, due to fast population growth and the restricted amount of available land.

It must be assumed that the original migrations of the Indo-Europeans from their mountainous homeland involved the kind of dispersal that is characteristic for the period following the rise of a food-producing economy, that is, after the Neolithic revolution. At that time there was a sharp population increase which led to a demographic explosion. This brought about an imbalance between the excess population and the forces of production, which led to migration into adjacent regions. The time period in question is characterized by inequality among regions: some had already undergone the shift to a food-producing economy and a demographic explosion, while significantly larger areas still retained the archaic food-collecting economy (such as hunting and gathering) and consequently their population density was very low. At the time in question, migration took place from areas with a production economy (in particular, Southwest Asia) to adjacent areas where the economy was still of the food-collecting type. This is Merpert's (1978:10-11) *second model of migration*, in contrast to the first model typical of earlier times when all areas had exclusively food-collecting economies.

similar cases where the language of immigrants has spread over the country they have occupied, the indigenous population which assimilates the new arrivals switches over to the new language and loses its former language.²⁴

A third means by which languages spread is displacement of the indigenous population from their former territory and resettlement of the land by immigrants.

Each of these types of language contact implies a partly analogous type of cultural and racial interaction, in particular involving mixture or displacement of human physical types. For example, when a language spreads by displacement of the old population, we see a more clear-cut entry of a cultural and physical type into the new territory from the former territory of the immigrants; while when the immigrants are assimilated by the local population there is less discontinuity of culture and physical type.

11.4.2. *Ancient Indo-European writing. The chronology and sources of Hittite-Luwian hieroglyphics*

The absence of a developed writing system may be considered one of the basic factors distinguishing Proto-Indo-European society from the advanced Near Eastern civilizations of the fourth to third millennia B.C. During the Proto-Indo-European period (the fifth to fourth millennia), writing in Sumer and Egypt was only in its infancy (Gelb 1963:60ff.; cf. Schmandt-Besserat 1978, 1979). At the time of the Indo-European breakup, writing was still not so well developed or widespread as to have spread to the neighboring peoples. This could have occurred only later, during the third millennium B.C., when Proto-Indo-European was already differentiated into dialects which had moved away in different directions. It is at approximately this time that writing arose in one of the Indo-European branches — Hittite — borrowed from the Old Akkadian cuneiform that had spread throughout northern Syria by the beginning of the second millennium B.C. (see Gamkrelidze 1961). Recent finds at Ebla of numerous cuneiform tablets in a Semitic language which can provisionally be called 'Paleo-Canaanite' confirm the existence of a distinct variety of cuneiform in northern Syria by the second half of the third millennium B.C., the time of Sargon of Akkad (ca. 2350-2250 B.C.).

24. The arbitrariness of such labels as 'ancient Indo-Europeans', 'Aryans', 'Balts', 'Slavs', 'Celts', 'Anatolians', etc. as purely ethnic or physical-anthropological designations is obvious. All such terms should be understood not as referring to compact and physically homogeneous ethnic groups but as arbitrary labels for tribes speaking Proto-Indo-European, Aryan, Germanic, Baltic, Slavic, Celtic, Anatolian, etc. dialects. In the present work, such terms have only this specialized meaning.

It must be assumed that the tribes speaking Indo-European dialects did not create writing themselves, but borrowed writing systems that had arisen on the basis of other languages. For instance, in historical times the Mycenaean Greeks borrowed the Linear B syllabary from another source. The source may have been Linear A, which was clearly created for a non-Indo-European language with an open syllable structure (see Ventris and Chadwick 1973, Morpurgo 1963, Gamkrelidze 1980). Later, at the beginning of the first millennium B.C., the Phoenician variant of the Semitic consonant-syllabic writing system was borrowed by the Greeks and transformed into an alphabetic system (see Gelb 1963:166ff.).

The only potential example of an ancient writing system native to Indo-European is Luwian hieroglyphic writing (Laroche 1960). There is reason to assume that this system is ancient and was used to write not only Luwian but also Hittite (Nesite).²⁵ It has been maintained that even before the rise of cuneiform writing among the Hittites a system of hieroglyphic writing was used for inscribing texts on wood. A special term GIŠ.ĤUR has even been preserved for inscriptions on wood, which could only have been hieroglyphic; and there is also a term for scribes who wrote on wood, DUB.SAR.GIŠ. Many of the cuneiform Hittite texts were evidently created by recopying of texts originally written in hieroglyphics. These texts are marked with the formula A.NA GIŠ.ĤUR.(TE)-kan *ḫandan* 'according to the inscription on wood' (Bossert 1952, Kronasser 1962).²⁶ If the use of this writing system by the Hittites could be definitively proven, it would have to be recognized as extremely old and as the only example known so far of an ancient writing system specially created for an Indo-European language.²⁷

25. The Old Assyrian variant of Akkadian cuneiform, widespread in Cappadocia in the early second millennium B.C., the period of the Old Assyrian trade colonies, could in principle have been taken over by the Hittites for the purposes of economic accounting. But it was not borrowed by the Hittites, evidently because they already had their own writing system, the hieroglyphic one with which they wrote accounting data and other texts. During the Old Hittite kingdom, when the Hittites emerged into history, it became necessary to compile chronicles and historical-political documents; the hieroglyphic writing was not appropriate for these functions, since its sphere of usage was evidently restricted to the needs of ritual and accounting. The weak development of hieroglyphic writing in its early period did not allow it to be used for writing historical chronicles; this would have forced the Hittites to turn to Akkadian cuneiform, which in fact was borrowed in northern Syria in the early second millennium B.C.

26. One and the same text may have been recopied several times, as is indicated by expressions like *[ki-ji pār-ku-i TUP.PU [A.]NA GIŠ.ĤUR.TE-kán ḫa-an-da-an* 'This is a clean tablet (i.e. a clean copy) corresponding to the original inscription on wood' (see Goetze 1948:231).

27. Noteworthy in this connection is evidence indicating the existence throughout the Iranian plateau of an ancient writing system, called 'Proto-Elamite' because it preceded Elamite writing proper, which appeared beginning with the second half of the third millennium B.C. in roughly the same western Iranian area (Lamberg-Karlovsky 1978, Amiet 1979, cf. Komoróczy 1975). Progress made so far in deciphering and analyzing this variety of pictography does not permit identification of the language of the inscriptions, but explaining the correspondences

Individual graphic prototypes of Hittite-Luwian hieroglyphic signs can be found in the Cappadocian tablets,²⁸ which testifies to the extreme antiquity of this variety of hieroglyphic writing. It is possible that it was used as a mnemonic device in ritual and accounting even in the Proto-Anatolian period, and that the signs later codified in Hittite-Luwian hieroglyphic writing must have been written on wood. This may reflect a Proto-Indo-European practice of using isolated mnemonic signs, especially for cultic and economic purposes.²⁹ In that case, the reconstructed archaic Indo-European evidence for the use of bark, especially birch and beech bark, for writing pictographic signs (see II.4.1.2.3) takes on particular significance.



Illustration 18.

Seal from Old Assyrian trade colony in Asia Minor,
with signs corresponding to Luwian hieroglyphic characters.
Early 2nd millennium B.C.

The complex of facts surveyed above pertaining to the intellectual and social life of the Indo-European-speaking tribes — their myths, rituals, and social organization, which reveal proximity to the Near Eastern cultures — makes it impossible that the Indo-European tribal grouping could have arisen in the fifth to fourth millennia anywhere in eastern Europe, in isolation from the civilizations of the ancient Orient.

between this newly discovered writing and the better-known Southwest Asian pictographic writing systems such as the early Sumerian one and Luwian hieroglyphics is of considerable interest.

28. Examples are the Sun God of the Sky symbol complex and the Life, Tree, Bull's Head, Goat Head, Bird, Vase, Hand, Star, Circle (single and double), Triangle, and Branch signs (see Börker-Klähn and Börker 1976:11-12, 24, Canby 1975).

29. If the archaic signs of Hittite-Luwian hieroglyphic writing can be traced back to originally mnemonic signs of Proto-Indo-European origin, then an analysis of this writing system in order to establish correlations between pictographic signs and elements of the cultural system reflected in the hieroglyphic writing would be of considerable interest. It could yield criteria for judging the nature of preliterate Hittite-Luwian culture, and might also shed light on a culture close to that of Proto-Indo-European.

11.5. Correlation of the Near Eastern homeland of Proto-Indo-European with the archeological cultures of ancient Southwest Asia

11.5.1. *Identifying an archeological culture in Southwest Asia that can be associated with Proto-Indo-European*

Taking into account the linguistic and culture-historical data surveyed above, we can locate the Indo-European community somewhere in the Near East and most likely on the northern periphery of Southwest Asia, i.e. somewhere from the south of the Transcaucasus to Upper Mesopotamia. This is where linguistic and cultural contacts could have occurred in the fourth millennium B.C. between Proto-Indo-European and Semitic, Sumerian, South Caucasian, and other languages of the ancient Near East. Contact with some of these languages, particularly South Caucasian and Semitic, can be assumed to have involved close interaction, in some cases of a substratal nature, over a long period of time within a single culture-historical and linguistic area.³⁰ Establishing an original

30. Pinpointing a Proto-Indo-European homeland is complicated by the fact that in none of the regions that have been proposed (Central Europe, the northern Black Sea area, the Balkans, Southwest Asia) is there clear evidence of Proto-Indo-European toponymy and hydronymy. This is primarily due to the great age of Proto-Indo-European. Assuming a breakup of Proto-Indo-European no later than the fourth millennium B.C., and possibly much earlier, the lack of documented Proto-Indo-European toponymy or hydronymy is due to the absence of any developed writing system in the Near East at this time; writing was only in a rudimentary stage (cf. Schmandt-Besserat 1979). The Proto-Indo-European toponymy would subsequently have been obliterated with the arrival of other ethnic groups and other languages, so that the toponymy recorded in the earliest written records would already have been non-Indo-European. On the other hand, there could be unrecognized early Indo-European toponyms and hydronyms recorded in ancient Near Eastern documents.

Of potential interest in this connection are names of countries neighboring on Mesopotamia that are preserved in Sumerian documents. One of them, *Aratta*, may be etymologized as Indo-European: *ar-th- 'water, river', i.e. 'the country of the river Aratta' (cf. *nārA-rat-ta-a* 'Aratta River', which flowed in the region of 'seven mountains' according to the well-known inscription of Sargon II (col. I 30: see Thureau-Dangin 1912:8)). The country of Aratta, located 'beyond the seven mountains', is mentioned in Sumerian epic legends reflecting events which date back to the beginning of the third millennium B.C. According to the Sumerian poem 'Enmerkar and the Lord of Aratta', the Sumerians traded with Aratta for precious metals, minerals, and stones, including lapis lazuli. Enmerkar, the ruler of Uruk, sends ambassadors to the ruler of Aratta to request delivery of goods to Mesopotamia (according to an unpublished paper by J. B. Jusifov, 'Early contacts of Mesopotamia with northeastern neighbors'). According to Kramer 1957, Aratta was located near the Caspian Sea, in the vicinity of Lake Urmia. This is approximately the area we propose as the Proto-Indo-European homeland.

Also entirely plausible is Henning's identification of the Guti (*G/Kut-* and *Tukri-* of ancient Near Eastern cuneiform documents), a people that inhabited the mountainous regions north of Mesopotamia and played an important role in Mesopotamian history in the Old Akkadian period (late third millennium B.C.), with the Tocharian tribes. The Tocharians entered history later, in the middle of the first millennium A.D., under the tribal names *Kuči* and *Toxār*, which could be phonetically regular developments of *Kuti-* and *Tokri-* respectively. This would then be the earliest historical documentation of Indo-Europeans, in the form of the ancestors of the Tocharians, who must therefore have lived in ancient Southwest Asia and only later migrated to the remote territory of Chinese Turkestan (see Henning 1978). This is in perfect agreement with

territory for the Proto-Indo-European language and people raises the question of identifying an archeological culture within the Near East and Southwest Asia that can be associated with Proto-Indo-European.

It must be noted at the outset that there is no archeological culture in the area and time period indicated that can clearly be identified as Proto-Indo-European. We can only speak of possible connections, direct or indirect, of known Southwest Asian archeological cultures of the relevant time period with Indo-European. Such connections of ancient cultures with the reconstructed features of Proto-Indo-European intellectual and material culture could serve as indirect evidence for the general possibility of identifying them with Indo-European. And in relevant areas of the Near East of the fifth to fourth millennia B.C. we do find a number of cultures exhibiting great similarity to certain features of the reconstructed Proto-Indo-European culture.

11.5.2. Features of the Halaf culture of Upper Mesopotamia in the fifth to fourth millennia B.C. which bear comparison to Indo-European

The Halaf culture of northern Mesopotamia is dated to the fifth to fourth millennia B.C. It is characterized by cultivation of grain — emmer wheat and barley — and the presence of two breeds of cattle as well as sheep, goats, and pigs. Spindles indicate textile production. Small copper beads have been found. Metallurgy can be assumed from the Halafians' acquaintance with the wheel and the wheeled carriage. The kilns, which produced a rich pottery, could reach temperatures of up to 1200° C. Pottery designs included stylized depictions of bulls' heads and horns (*bucrania*); there are also figurines of bulls' heads as amulets. Other amulets include birds, double axes, and half-moons. Property marks indicate accumulation of wealth, personal property, and trade exchange (Childe 1934 [1956:174-77]; see Merpert and Munčaeв 1971). Burials were in contracted position and inside of the settlement.

Similarity of culture, and especially of symbolism, can be observed between Halaf in northern Mesopotamia and Çatal Hüyük in western Anatolia of the sixth millennium B.C. Whole inventories of cultural, and in particular cultic, symbols can be said to coincide: bulls' horns (and sometimes rams' horns) as a virility symbol, ritual depictions of leopard skins (on pottery in Halaf): see Mellaart 1965.

The culture-historical links between the Halaf culture and the earlier Çatal Hüyük culture could be interpreted as due to migration of the Çatal Hüyük culture from Asia Minor in the direction of northern Mesopotamia in the sixth to fifth millennia B.C. Under this interpretation, the Çatal Hüyük culture could

our hypothesis of a Near Eastern homeland for the Indo-European tribes and an initial center of Indo-European dispersal in the Near East.

be traced to an ancient stratum of the Indo-Europeans who migrated toward the east.

In addition to its similarities to Çatal Hüyük, the Halaf culture also exhibits links with the oldest cultures of the Caucasus. The presence of both round and rectangular house forms in Halaf has been attributed to interaction between Near Eastern and Caucasian cultures in the fifth millennium B.C. (A. Džavaxišvili 1973:300-301, 346, 350). The influence of the Halaf culture can be seen both to the west, in Anatolia and northern Syria (see Woolley 1953:26-27), and to the east, in Iran.

In the fourth millennium B.C., Halaf settlements were destroyed as a result of the arrival of the Ubaid (pre-Sumerian) culture. Traces of the Halaf culture were able to persist for a long time in the more outlying mountain forests of northern Mesopotamia, which continued to lag in their development behind the cultural centers of ancient Mesopotamia (see Childe 1934 [1956:179, 313ff.]).

It is worth noting that the dispersal of the Halaf tribes beyond Mesopotamia, and the migration of groups close to the Kura-Araxes culture (see below) into northwestern Iran and eastern Anatolia, serve as typical examples of the migration type characteristic of the time after the rise of a production economy, the *second model* of Mergert 1978:15, 20.

11.5.3. The Eneolithic culture of the southern Caucasus in the fifth to fourth millennia. The Kura-Araxes culture of the third millennium and its ethnic identity

A partly similar culture, synchronous (fifth to fourth millennia) with the Halaf and Ubaid cultures, is found in the southern Caucasus (the Shulaveri-Shomutepe culture).³¹ The Eneolithic of the southern Caucasus is characterized by a farming-herding economy with farming predominant, cultivation of barley, wheat, and spelt, grape-growing, the presence of sickles and grinding mortars for grain, predominance of cattle in the herds, round houses of clay or unfired brick, developed pottery making, incipient bronze metallurgy, and symbolic depictions of grains and solar and lunar disks (see Kušnareva and Čubinišvili 1970:170-71, Kiguradze 1976). The pottery, ornamentation, and other cultural features of Shulaveri and Shomutepe suggest some sharing with the contemporaneous cultures of Anatolia (Çatal Hüyük) and Mesopotamia (Halaf) and connections among them.

Despite the similarity of material culture testifying to cultural sharing and

31. Based on radiocarbon dating done in the C₁₄ laboratory of the University of California, San Diego, artifacts from the Shulaveri culture date from the sixth to early fourth millennia B.C., and primarily from the fifth millennium, which coincides with the time of the Halaf culture (see Kiguradze 1976:133ff.).

contacts among these archeological areas, ethnically distinct populations must naturally be posited within the cultural region. Each participating ethnic group must have had its own language and local distinctive culture elements, as is shown by the presence of local traits in the archeological cultures.

Also belonging to this early Caucasian culture with its links to contemporaneous northern Mesopotamian culture is the succeeding Kura-Araxes culture (named for the first site found, in the vicinity of the Kura and Araxes Rivers: see Kuftin 1940), which covers a wide culture area including eastern Anatolia, the southern Caucasus, and the Iranian plateau (see Piotrovskij 1949, 1955, Burney 1958). Kura-Araxes pottery has been linked to the Khirbet-Kerak ware from Palestine of the second half of the third millennium B.C., which is regarded as testifying to a brief encroachment of the Kura-Araxes culture into Palestine (Woolley 1953:31ff., Kušnareva and Čubinišvili 1970:15, 16, 60).

In addition to features shared with the Eneolithic cultures of the southern Caucasus, the Kura-Araxes culture of the third millennium B.C. is distinguished by an increase in population density and in the number of large settlements, construction of settlements on high riverbanks and mountainsides, an increase in the size of both round and rectangular houses, and the appearance (late in the period) of large burial chambers, sometimes with an internal timber framework, covered by huge kurgan mounds. There is an increase in the inventory of grains, harvesting with metal sickles, grape cultivation, and the use of wheeled transport, horses, and mules (see Kušnareva and Čubinišvili 1970:172-73, Džaparidze 1976:62ff.).

The Kura-Araxes cultural inventory is broadly consistent with the material culture and social relations reconstructed for Proto-Indo-European, and especially for some of its later branches.

The Kura-Araxes culture area clearly comprised various ethnic groupings, who created a common general culture with individual local distinctions.³² The ethnic groups that have been proposed as bearers of the Kura-Araxes culture are Hurrian (Burney 1958, Diakonoff 1966) and South Caucasian (Džaparidze 1969, 1976:286). Indo-European ethnic groupings, which had by then separated from the Proto-Indo-European community and left their original territory, must also be included among them (see Melikišvili 1965a:244, Mačavariani 1966:9).

A further indication that an Indo-European ethnic element participated in the formation and development of the Kura-Araxes culture is the culture's characteristic use of wheeled transport with horses as draft power,³³ which can

32. This is the explanation given for the existence of various burial types within the Kura-Araxes cultural tradition: burials inside and outside of settlements, burials in graves in the earth, in stone boxes, in kurgans, and occasionally cremation (in the later period, in burials of leaders): see Mellaart 1965:31 *et pass.*

33. Wheeled carts are found in sites of the Kura-Araxes type in Anatolia (Mellaart 1965) and the southern Caucasus (Bedeni: see Kušnareva and Čubinišvili 1970:111; see also Piotrovskij 1955:6). Bones of horses have been found in a number of Kura-Araxes burials: in

probably be ascribed specifically to Indo-European tribes in the culture history of this area. Wheeled transport and horses as draft animals, widely used by the Indo-European tribes, can be seen as a revolution in transportation which made possible migrations of the scope of those that distinguish the Indo-Europeans (see Piggott 1979).

The influence of Indo-European tribes in the formation of the region's culture can also be seen in the burial rites which spread near the end of the Kura-Araxes period. By that time a number of regions of the Kura-Araxes culture, in particular Asia Minor (Alaca Hüyük: Mellaart 1965) and the southern Caucasus (Trialeti and later Lchashen, by the first half of the second millennium B.C.: Džaparidze 1969, Masson 1973), were practicing burial of leaders in a chariot followed by cremation, in exact correspondence to the picture of burial rites reconstructed for Proto-Indo-European culture (see Piotrovskij 1955:6, 1959:153).

In this we can see the results of the Proto-Indo-European breakup and the beginning of the migrations of tribes speaking Indo-European dialects, datable to the Bronze Age, before the spread of iron.

Shengavit and Elar (Armenia), Didube and Kvaxelebi (Georgia), Karaz (eastern Anatolia): Munčaeu 1973:71.

Chapter Twelve

The migrations of the Indo-European-speaking tribes from their Near Eastern homeland to their historical territories in Eurasia

12.1. The separation of the Anatolian community from Proto-Indo-European and the migrations of the Anatolian-speaking tribes

12.1.1. The correlation of the territories of the earliest historical Indo-European dialects with the Proto-Indo-European homeland

If we place the Proto-Indo-European homeland of the fifth to fourth millennia B.C. within eastern Anatolia, the southern Caucasus, and northern Mesopotamia it becomes easier to explain the historical territories and migration routes of the major early Indo-European ethnic groups who first appear in ancient written documents: the Hittites and Luwians, the Indo-Iranians, the Greeks (the Cretans and Mycenaeans, and the Ahhiyawa of Hittite sources). On this account there is no need to assume that these people had covered vast distances in moving from their original territories; only small displacements need be posited. It is important that these dialects, which are the least removed from the Near Eastern homeland, are the earliest Indo-European dialects to be recorded in written documents.

12.1.2. The westward movement of the Anatolian-speaking tribes in Asia Minor during historical times

The Anatolian group must be regarded as the first dialect community to have separated from Proto-Indo-European and begun an independent existence (see the diagram of Proto-Indo-European dialect divisions in Chapter 7 of Volume I, Figure 3). Proto-Anatolian moved a relatively small distance from the Proto-Indo-European homeland. This explains the extreme archaism of the Anatolian languages attested in early written documents.

In historical times the Anatolian languages — Hittite, Luwian, and Palaic — were spoken in the central regions of Anatolia in Asia Minor. This distribution is the result of westward migration. At the outset of the historical period,

westward (and later southward) movement of the Hittites can be assumed on the basis of historical Hittite documents. Evidence for this is the privileged position of the eastern cities in Hittite tradition. Certain categories of inhabitants of cities such as Nerik, Arinna, and Zippalanda, located in the eastern part of the Hittite kingdom, were relieved of obligations (§50 of the Hittite Laws; see Sommer 1947).¹ The same implication can be seen in the Hittite myth of the sun rising from the sea (or large lake: Hitt. *aruna*-).² This sea or large lake was believed to be located to the east of the original Hittite territory (and possibly the Proto-Anatolian territory as well, since the same myth is found in Palaic). It could have been the Caspian Sea or one of the large lakes in the Near East — Lake Van or Urmia.³ These mythological themes may reveal distant memories of westward migrations from an original territory.

Hittite and Palaic, already separate dialects of Anatolian, spread into northern Anatolia, which at the time of the Anatolian breakup was occupied by the Hattic tribes who probably spoke a language of the Caucasian, possibly Northwest Caucasian, type (see Dunaevskaja 1960, 1961, Kammenhuber 1969, Ardzinba 1979).⁴ There was a long period of interaction between Hittite-Palaic and Hattic, and a great many ritual and social terms were borrowed into the Anatolian languages from Hattic (see Kammenhuber 1969).

Throughout the entire third millennium B.C. the archeological culture of Anatolia shows unbroken continuity, with no obvious trace of a sudden forcible entry of a new ethnic element (Bittel 1953).⁵ Therefore the diffusion of the Anatolian tribes into Asia Minor must have been, not the result of a sudden

1. The westward movement of the Anatolian dialects never stopped throughout their history, as shown by the location of the late Anatolian languages Lydian and Lycian. Late forms of Hittite and Luwian, they were spoken during the first millennium B.C. at the extreme west of Asia Minor, in historical Lycia and Lydia on the eastern coast of the Aegean.

2. Cf. KUB VI Vs. III 13-14: *ša-ra-a-kán u-w[a-š]i ne-pl-ša-aš* DUTU-uš *a-ru-na-az* 'you come up, O heavenly Sun God, from behind the sea'.

3. An analogous interpretation should clearly be given to the symbol of the sea, from beyond which the king receives his power and royal carriage: LUGAL-u-e-mu *ma-ni-ya-aḥ-ḥa-en* *GIŠhu-lu-ga-an-ni-en* *GIŠDAG-iz a-ru-na-za ú-da-aš* (KUB XXIX 1 I 23-24) 'to me, the king, the God of the Throne brought my royal power — a carriage — from beyond the sea'. The interpretation of *aruna*- in this context as referring to the Black Sea (Neu 1974:125, note 303) on the sole strength of *URUZalpaz arunaz* 'from beyond the Zalpa Sea' (i.e. the Black Sea) (Otten 1973:20) is not justified.

4. This is probably the explanation for the similarity of the Alaca Hüyük culture of Central Anatolia in the late third millennium B.C. and certain types of Kura-Araxes pottery from the Caucasus (see Woolley 1953:32-37).

5. Cappadocian polychrome pottery from southeast Anatolia is usually linked with the appearance of Indo-European tribes in Asia Minor (Goetze 1957). However, this polychrome ware, distinct from the monochrome type characteristic of local tradition from ancient times, does not disrupt the unbroken continuity of local Anatolian culture that extended from the beginning of the third millennium B.C. to the end of the Hittite Kingdom. Cappadocian ware is not a replacement of one style by another, but a parallel development of another style. Moreover, the major sites for Cappadocian ware lie outside the center of Hittite culture (see Bittel 1950:47).

invasion sweeping away the centuries-old local cultural traditions, but a gradual penetration of a new ethnic element into the local population (Gamkrelidze 1970:142).

In view of recent archeological finds of horse bones in eastern Anatolia (excavations of German expeditions in Demirci Hüyük, Yarıkaya, and Norşuntepe), Indo-European tribes must have appeared in these parts of Asia Minor even earlier, by the end of the fourth millennium B.C. (see Mellaart 1981).

12.1.3. Anatolian lexical borrowings in the languages of the southern Caucasus (Kartvelian, Urartean)

That the Anatolian languages of prehistoric times were located to the east and northeast of their historical territory can also be concluded from ancient Anatolian borrowings into the languages of the southern Caucasus, Urartean and Kartvelian:

Urart. *Ḫi-u-i-ni* 'Sun god': Hitt. *šiu-*, *šiu-na-* 'god', *šiwatt-* 'day';⁶ Urart. *kapi* 'dry measure': Hitt. *DUGkappi-* 'dry measure' (Diakonoff 1971:81); Urart. *atu-* 'eat': Hitt. *et-*, *at(u)-* 'eat'.

Kartv. **štum-* 'ear': Svan *šdim* 'ear', Geo. *sa-stum-al* 'head of bed' (E. Osidze, p.c.) compared to Hitt. *ištam-* in *ištam-aš-* 'hear', *ištam-ana-* 'ear',⁷ Luw. *tumman-* 'ear' (?) (Laroche 1959a:99); cf. also Hitt. *ištama-ḫura-* 'earring', with a second element *-ḫura-* comparable to Geo.-Zan **q'ur-i* 'ear': Geo. *q'ur-i*, Laz *q'už-i*.⁸

Kartv. **wel-* 'field': Geo. *vel-i* 'valley', Mingr. *ve(l)*, cf. Hitt. *wellu-* 'meadow, valley' (Giorgadze 1979), PIE **wel-*.

Geo. *dum-* 'be silent', *dum-il-i* 'silence', comparable to the Hittite reduplicated stem *duddumili* (possibly from **dum-dum-ili*) 'secretly, in secret' (Giorgadze 1979). Borrowing in the opposite direction is also a possibility.

6. An ancient Hittite loan into Urartean, with the meaning 'sun god' that the word evidently had in prehistoric Hittite. It antedates the appearance in Hittite of the Hattic word for 'sun god': Hatt. *eštan*, Hitt. *ištanu-*. The Urartean loan is specifically from Hittite and not from Proto-Anatolian, as shown by the initial sibilant which is the Hittite reflex of **ty-* (PIE **t'-*): cf. Luw. *tiwaz*, Pal. *tiyaz* but Hitt. *šiwatt-*.

7. The Hittite stem *ištam-* may in turn be connected to Semitic **s-m-c*, which may be represented by Kartvelian **sm-* 'hear': Geo. *e-sm-i-s* 'hears', verbal noun *sm-en-a*, Mingr. *sim-in-u-a*, Laz *i-si-min-s* 'listens'. In Semitic the reflexive form with infixes *-t-*, **s-t-m-c*, essentially coincides with the Hittite *ištam-*. A possible relationship of all these forms — Kartvelian, Hittite, and Semitic — cannot be excluded. If Luw. *tumman-* 'ear' (?) is etymologically related to Hitt. *ištam-ana-* (see Oettinger 1980:61), then the word must be posited in the meaning 'hear, ear' for Proto-Anatolian.

8. A Kartvelian source for the second element of the Hittite compound *ištama-ḫura-* 'earring' cannot be ruled out. The Kartvelian glottalized uvular **q'*, lacking in Hittite, is replaced by the velar spirant *ḫ*. Note also Hitt. *puri-* 'lip', of unknown etymology, which can be compared to Kartv. **p'ir-i* 'mouth, lip': Geo. *p'ir-i* 'mouth', Mingr.-Laz *p'iž-i* 'mouth', Svan *p'il* 'lip'.

There are also Hittite-Svan mythological links, which can be explained by assuming a more southerly location of the Svans relative to their historical territory (see Melikišvili 1965a:60ff., Mikeladze 1974:9ff.). The Svan ritual *melia-t'elepía*, where *melia* is interpreted as connected to Hitt. *melit* 'honey', could have arisen under the influence of the Hittite myth of Telepinus (see Bendukidze 1973). In this connection note the invocation *Telepen'* in Russian charms (Toporov 1975a), which probably entered Russian via a Caucasian intermediary.

12.2. The breakup of Greek-Armenian-Aryan dialect unity and the migrations of Greek speakers

12.2.1. The Greek-Armenian-Aryan dialect grouping and its breakup. The early separation of Indo-Iranian

The separation of Proto-Anatolian from Proto-Indo-European was followed by the separation of the Greek-Armenian-Aryan dialect grouping, which subsequently divided into Greek, Armenian, and Indo-Iranian. The widespread migrations of the tribes making up this dialect community evidently began after its breakup and the creation of Greek, Proto-Armenian, and Indo-Iranian as individual Indo-European dialects. This breakup evidently began when the dialect grouping was still part of Proto-Indo-European, with the formation of a separate Aryan dialect area while Greek-Armenian dialect unity was still preserved.

After the separation of Indo-Iranian, the Greek-Armenian dialect community remained in its former territory, where it was in contact with other Indo-European dialects, particularly Tocharian and Ancient European. Thus we have words such as Gk. *mén*, Arm. *amis* (from **mensos*), Toch. A *mañ*, B *meñe* 'month', Lat. *mēnsis*, Umbr. *menzne*, OIr. *mí* (from **mens*), Goth. *mēna*, Lith. *mėnuo*, OCS *měsęcĩ* against Indo-Iranian *mās-*; or Gk. *aróō* '(I) plow', *árottron* 'plow', Arm. *arawr* 'plow', Toch. A, B *āre* 'plow', Lat. *arātrum*, OIr. *airim* '(I) plow', Goth. *arjan* 'plow', Lith. *ariù* '(I) plow', OCS *orjǫ* '(I) plow' against the absence of this word in Indo-Iranian and Anatolian.

This is the time when the shared lexical and structural isoglosses peculiar to Greek and Armenian could have arisen. They include vocalic prothesis, as in Gk. *odoús*, Arm. *atamn* 'tooth'; the lack of initial *r-* (an innovation possibly of substratal origin); and numerous lexical isoglosses, such as Gk. *hénnūmi* and Arm. *z-genum* '(I) get dressed'; Gk. *aléō* '(I) grind', *áleuron* 'flour' and Arm. *ałam* '(I) grind'; Gk. *hépsō* '(I) boil, cook' and Arm. *ep'em* '(I) boil, cook'; Gk. *hēmar* and Arm. *awr* 'day'; Gk. *kłōn* 'column' and Arm. *siwn* 'column'; and

others (see Porzig 1954:155-57 [1964:230-33], Mann 1963; cf. also Greppin 1982a).

A Near Eastern homeland for Proto-Indo-European provides naturally for the direction taken by the speakers of Greek dialects in their migrations across Asia Minor to their historical territory in the Peloponnesus and the islands of the Aegean Sea. If we assume that the Greeks migrated across Asia Minor (and that the Dorians split off from the main wave of migration and spent some time farther north in the Balkans, to enter Greece later), then we can see the ancient presence of the Greeks in Miletus and Ahhiyawa as a relic of these early migrations. Support for this comes from links observed between the cultures of western Asia Minor and those of the Peloponnesus and the Aegean islands.⁹ At the end of the third or beginning of the second millennium B.C. (and apparently also much earlier, in the mid-third millennium: Thomas 1970:201), Minyan gray ware pottery is found through northwest Asia Minor (Beycesultan). It is the same type that becomes the dominant ware in mainland Greece about a century later (ca. 1900 B.C.). A direct connection has been established between these cultures, and the direction of movement is assumed to have been from east to west (Mellaart 1958, Lloyd 1961; for refinements see Thomas 1970:201ff.).

The ethnic substratum of these cultures would have been the Proto-Hellenic Greeks (minus the Dorians),¹⁰ or possibly other groups of Indo-Europeans moving westward¹¹ with the Greeks under pressure from the Anatolian tribes. Among them may have been the 'Pelasgians', who are thought to have been established in the Peloponnesus before the entry of the Greeks proper.¹² A possible relic of these pre-Greek Indo-European dialects may be the toponyms with suffixes *-(s)s-*¹³ and *-nth-* (see above for hydronyms in **-nth-*) found

9. The links between Anatolia, the Peloponnesus, and the Aegean islands were so strong, and the cultural influence from the east on the Aegean world so significant, that we can even speak of an 'Anatolian-Aegean cultural koine' during the Early Bronze Age (see Schachermeyr 1955:173).

10. Proto-Greek must have differentiated into its main dialect groups somewhere in Asia Minor before the migration to mainland Greece. In any case we must assume that it divided into two groups, one of which — the Dorians — moved northwest to the Balkans and much later, toward the end of the second millennium, invaded mainland Greece.

11. Crossland's objections (1957:38-41) to this hypothesis, based exclusively on linguistic data, cannot be considered convincing at this time, since the areal-linguistic evidence can also be interpreted as supporting the hypothesis.

12. 'Pelasgian' may have served as a substratum to Greek, which overlaid it. The 'Pelasgian' words which entered Greek give us the possibility of reconstructing the structure of the substratal language in broad outline; it preserved a number of archaic traits (see Georgiev 1941-1945, Merlingen 1962). In particular, 'Pelasgian' preserves the voicelessness of Indo-European Series I stops and the aspiration of Series III.

13. For example, the toponym *Parna(s)sós* and *Parnašša-*, the name of a city with a cultic sanctuary in Cappadocia (cf. the Proto-Anatolian word for 'house', Hitt. *pir*, gen. *parnaš* 'house'). The interpretation of this place name as 'pertaining to a temple' is entirely plausible, although there are insufficient grounds for regarding the word as specifically Luwian (see Palmer 1965:26, 241-42, 254); it may rather have wider Indo-European connections within

throughout mainland Greece and all of Asia Minor (see Schachermeyr 1955:55ff., Hester 1957, Solta 1958:30ff., Chadwick 1969).¹⁴

12.2.2. The migrations of the Proto-Hellenes to mainland Greece and the Aegean islands via Asia Minor. The pre-Greek substratum

In addition to the possible Indo-European substratum, some non-Indo-European (and probably pre-Indo-European) substratum must be posited in mainland Greece and the Aegean islands. The substratum is revealed by the presence of a non-Indo-European lexical stratum in Greek (see Furnée 1972). It is obviously linked to early Minoan culture and possibly to the inscriptions written in Linear A and other very early writing systems of the eastern Mediterranean world (see Gindin 1967, Birnbaum 1974).

12.2.3. The ancient Greek regions of western Anatolia (Miletus, Ahhiyawa) as evidence for historical migrations of the Proto-Hellenes across Asia Minor

The hypothesis of a Greek entry into Greece from the east via Asia Minor places the Greek colonies of Asia Minor, and especially Miletus, in a new light. On the hypothesis of an eastern origin, these colonies are to be viewed rather as settlements created during the westward migration to the Aegean and mainland Greece.

A fortress of the Mycenaean period, dating from the sixteenth to fourteenth centuries B.C., has been found at Miletus, and a burial of the Mycenaean type with evidence for burial of a horse (a bronze bit: Mellink 1976:270), as well as the ruins of a temple to Athena and Mycenaean ceramic ware (see Kleiner 1969-1970). The Pylos tablets mention 'women from Miletus' (*mi-ra-ti-ja* = *Milātiai* 'Milesian', nom. pl. fem.; cf. the later *Milēsios* 'Milesian') and other cities of Asia Minor — Halicarnassus (Zephyria), Iasos, Ephesus (see Ventriss and Chadwick 1973:410). Other archeological cultures of the Mycenaean type are found elsewhere on the western coast of Asia Minor, which would have been the Greeks' last area of settlement in Asia Minor prior to their further movement onto the Aegean islands and mainland Greece (see also Pisani 1959:193).

Anatolian. The word recalls the Hittite formula *parnašša šuwaizzi*, found in ancient laws and denoting a particular type of compensation for crimes and damages (for various interpretations see Imparati 1964:189-94). The form *parnašša* could be analyzed as derived from *pir/parn-* 'house' with the same suffix *-šš-*, i.e. *parnašši* (neut. pl.) 'household property' + *a* 'and' > *parnašše-a*. Then *parnašša šuwaizzi* could mean 'and he gives back (unwillingly) the household property' (lit. 'throws back, throws out').

14. For references see Gindin 1967, Merlingen 1962.

Further evidence comes from references in Hittite sources to a country *Aḫḫiyawa*-, *Aḫḫiya*-, which can be identified with the self-designation of the Achaeans. ¹⁵ All of the traditional difficulties associated with the name *Aḫḫiyawa* ¹⁶ are due to the a priori opinion that the Greeks' original territory was the Peloponnesus. If the hypothesis of a migration via Asia Minor and long-term residence in Asia Minor is accepted, the difficulties disappear.

According to Hittite sources, the country *URUAḫḫiya* was located in Asia Minor not far from the Hittite kingdom (see Goetze 1957:183). ¹⁷

12.2.4. Greek-Anatolian links as evidence for an earlier Greek habitation in Asia Minor

The historical presence of the Greeks in Asia Minor after the breakup of Greek-Armenian-Aryan dialect unity is reflected in numerous lexical and culture-historical connections between Greek and the linguistic world of Asia Minor. Traces of these connections can be seen in lexical loans and in shared mythological and ritual themes that arose at a time when Greek already existed as a separate language. ¹⁸ Words which came into Greek dialects from languages of Asia Minor and testify to contacts at a time when Greek was spoken in Asia Minor include the following. ¹⁹

15. E.g. *DINGIRLUM URUAḫḫi-ya-wa-kán ku-iš* *DINGIRLUM URULa-az-pa-ya* 'the god of the country of Ahhiyawa and the god who is of the country of Lazpa [Lesbos]' (KUB V 6 II 57, 60; see Carratelli 1950); *LÚ URUA-ahḫi-ya* 'a person of the country Ahhiya; an Achaean' (KBo XVI 97; KUB XIV 1 Rs. 89; Madduwatta text, dated to the fifteenth century B.C.: Otten 1969). The Hittite word clearly renders the Greek self-denomination (cf. Hom. *Akhaiōi* 'Achaeans'). The term is also found in Mycenaean texts: *A-ka-wi-ja-de* (Ventris and Chadwick 1973:209, 436-37, 529, 539).

16. See Sommer's objections (1932, 1934, 1937) to the possibility of identifying Hitt. *Aḫḫiyawa*- and Gk. *Akhai(w)oi*, based on a hypercritical assessment of the phonetic similarity of the forms. At the present time most investigators do not question the identity: see Steiner 1964, Harmatta 1968, Muhly 1974 (for the earlier history of the question see Schachermeyr 1935:20ff.).

17. The Tawagalawas letter mentions that nobles and representatives of the royal clans of Ahhiyawa and the Hittite kingdom traveled to that country on chariots, which would argue against locating Ahhiyawa exclusively on the islands. The Hittites' constant concern about establishing friendly and peaceable relations with Ahhiyawa also testifies to the physical closeness of Ahhiyawa to the Hittite kingdom (see the Madduwatta text: Otten 1969).

18. Several ancient Greek ethnonyms have a distinctly Asia Minor character: *Ἰᾶ(w)ones* 'Ionians', from **Ya-wana*-, with the Anatolian suffix *-wana-* (Luw. *-wan-*), from *Ya*- 'Cyprus' (cf. Lyc. *iyānatiya*, where *-tiya* is another Anatolian suffix, cognate to Hitt. *-zzi*); *Δαναοί* 'Danaeans', comparable to Hier. Luw. *Adana-wana* > **Danawanni* > Akkad. *Danūna*, Egypt. *D3ynywn3* (with an exact parallel in the Welsh river name *Donwy* and a number of Semitic loanwords in river names): see Arbeitman and Rendsburg 1981.

19. On the other hand, there are words of Semitic provenience in Greek (including Mycenaean): Myc. *ku-ru-so* 'with gold', Hom. *khrusós* 'gold' (cf. Hebr. *ḥārūš*, Akkad. *ḥurāšu*), Myc. *ki-u-ro-i* 'vessel, pot' (Hebr. *kiyyôr* 'pot'), Myc. *sa-sa-ma* 'sesame', Gk. *σάμαν* (Akkad. *šamašannū*, cf. Hitt. *šammamma*-), and others (see Masson 1967), as well as several

Hom. Gk. *ikhōr* 'immortal blood of the gods' (*ámbroton haîma theoío*, Iliad 5.339-40), later 'blood': cf. Hitt. *ešḫar*, *išḫar* 'blood' (Kretschmer 1951, Neumann 1961:18).

Hom. Gk. *dépas* 'vessel, dish', Myc. *di-pa*: cf. Hitt. *tapišana*- 'vessel, dish' (Neumann 1961:20).

Gk. *búrša* 'hide, skin': cf. Hitt. *kurša*- 'skin, hide, fleece, shield' (Laroche 1947:75, note 4; for the shift of *k* to *b* in the Greek form see I.1.5.7n66).

Gk. *thúrsos* 'thyrsus, staff twined with ivy carried by bacchants': cf. Hier. Luw. *tuwarsa* 'grapevine' (Heubeck 1961:80, Neumann 1961:86-87). These last two words have an *-rs-* cluster in Greek, whereas in native words **-rs-* gives Gk. *-(r)r-*.

Gk. *kúanos* 'copper, steel', *kuáneos* 'blue', Myc. *ku-wa-no* 'blue glass'; cf. Hitt. *kuwanna*- 'copper, vitriol; copper blue' (Halleux 1969).

Gk. *kúmbakhos* 'spike of helmet': cf. Hitt. *kupaḫ(ḫ)i-* 'hat, headdress' (Szemerényi 1974:153).²⁰

Possibly also relevant is Gk. *tragōidós* 'tragic actor, actor' (cf. *tragōidía* 'tragedy'), cf. Hitt. *tarkuwa(i)-* 'dance; rage, be violent' (Szemerényi 1975:319-32).

An example of an ancient loan in the other direction, from Greek to Anatolian, is Hitt. *dammara-*, Luw. *dammaranza* 'female servants' (in one instance 'servant') beside Myc. *da-ma-te* 'servants', Hom. *dámar*, gen. *dámartos* 'wife' (Neumann 1961:37, Gusmani 1968:86).

Especially important evidence for ancient connections between Greece and the cultural world of Asia Minor is the unity of mythological motifs from the two traditions (see Harmatta 1959, 1968a). The Greek myth of the Mysian king Telephos (*Télephos*, a shortened form of *Télephánēs*) shows a striking coincidence in theme and names of heroes with the myths of Telepinus and the children of the queen Kanēs from Asia Minor; note also the name of Telephos's son, Tarkhon, beside Hitt.-Luw. *Tarḫunt-* (see Barnett 1956, Toporov 1975a:36-45).

The entire cycle of Greek theogonic myth, the struggle of several generations of gods in the heavens, ultimately reflects ancient Oriental themes which entered Anatolian myth in altered form (coming via Hurrian) and entered Greek myth from Anatolian. This can be seen not only in plot structure but also in a number of divine epithets: cf. the name of the Greek god *Ouranós* 'Sky' as a translation of Hurrian-Hittite *Anu-*, beside Sum. AN 'Sky', Akkad. *Anum* (Laroche

ancient Egyptian words (see Ernštedt 1953). They could have been borrowed by the Greeks either in Asia Minor or in Greece and the Aegean islands as a result of intensive trade and sea contacts.

20. The word is of interest in view of the rendition of Hitt. *ḫ(ḫ)* as Gk. *kh*. One of Sommer's objections (1934:74) to the identification of Hitt. *Aḫḫiyawa-* and Gk. *Akhaiōi* was that it required a correlation of Hitt. *-ḫḫ-* to Gk. *χ* (*kh* = [k^h]).

1966a:294); the epithet assumed for Zeus, **Zant-*, beside Luw. *Šanta-*, epithet of the thunder god (see Houwink ten Cate 1961:136, West 1971:50-52); also Hesiod's epithet *próteroi theoi* 'bygone gods' (West 1966:301) beside Hitt. *karuileš šiuneš* 'past gods', Hurr. *ammattina* 'past', used of gods in a mythological context (see Salvini 1977:89, 91, Laroche 1978:47). The order of the generations of gods and the relations among them also coincide (see Webster 1958:64-90, Littleton 1970).

A number of Homeric motifs, especially in the Odyssey, go back to ancient Oriental prototypes from Sumero-Akkadian and Asia Minor: the myth of the cyclops Polyphemos (and possibly his very name, which can be compared to the name of the ancient Mesopotamian hero Gilgamesh, cf. the Sumerian variant *Dbil.ga.meš*, Hurr. *Dbil.ga.miš*, Hitt. *DGIŠ.GIM.MAŠ*; the Greek form points to a source **bala-gwh-āmo-*, see Obenhuber 1974); the oath of Odysseus involving a journey to the underworld (cf. ancient Oriental myths of travels of the gods to the underworld: Steiner 1971); and others.

These and similar mythological motifs must be assumed to have entered Greek while the Greek speakers lived in Asia Minor and were in intensive culture-historical contact there, beginning in the second millennium B.C. Myth plots that arose on Anatolian soil were subsequently transformed in Greek mythology and acquired specifically Greek traits, while preserving earlier features shared with ancient Oriental epic literature.

12.2.5. *The Greek migration to mainland Greece from the east. Greek-Kartvelian lexical ties and the myth of the Argonauts*

The hypothesis of a Greek migration to the Aegean islands and mainland Greece from the east via Asia Minor also explains the existence in Greek of a lexical stratum of Kartvelian (South Caucasian) origin. A number of Greek words of unknown etymology find unambiguous Kartvelian parallels in the light of recent research (see Gordesiani 1969, 1970:217ff., Furnée 1979) and testify to linguistic contacts at an ancient date between Greek and Kartvelian dialects (Furnée 1979:14ff.).

Gk. *ósprion* 'vegetables with hulls or pods; fruits; beans' beside Geo. *osp'-i*, *osp'n-i* 'lentils' (without correspondences in the other Kartvelian languages).

Gk. *khédropa* (pl.), *khédrops* (sg.) 'vegetables with hulls or pods': cf. Kartv. **qnd-(u)r-*: Geo. *qndur-i* 'beans', Svan *ɣeder* id. (Greek adds a suffix *-op-*; cf. *khedría* = *khédropa*, without the suffix). Note the reflex of Kartv. **ŋ* as *e* in Greek, as in Svan.

Gk. *iskhás* 'spurge, euphorbia' (*Euphorbia* L.): cf. Kartv. *(*ŋ*)*sx-al-*: Geo. (*m*)*sxal-i* 'pear', Mingr. *sxul-i*, Laz *mcxul-i*, Svan *icx* id. (the borrowed Greek form has a prothetic *i-* before the cluster *skh-*).

Gk. *déllis* (in an inscription from Pisidia in southern Asia Minor, first century B.C.) = *délphaks* 'piglet': cf. Geo. *tel-i* 'piglet', Mingr. *tu*, Laz *tila* id. (Kartv. **tel-*).

Gk. *agór · aetós · Kúprioī* (Hesychius) 'eagle': Kartv. **kor-* 'hawk': Geo. *kor-i*, Mingr. *kir-i*, Laz *kur-i*, *m-kir-i* (with prothetic *a-* in the Greek form).

Gk. *záros* 'bird of prey': cf. Geo. *zer-i*, *zera* 'kite' (with no correspondences elsewhere in Kartvelian); the Greek form has *a*, the vocalism that would be expected for the Proto-Kartvelian word in its western variant, where the vowel shift of **e* to **a* had already taken place.

Gk. *gána · khérsos · gē* (Hesychius) 'dry land, earth': Kartv. **q'ana-*: Geo. *q'ana* 'field, earth', Mingr. *'ona*, Laz *q'ona* id.

Gk. *sphérta · tà áphora déndra* (Hesychius) 'tree that does not yield fruit, barren tree': cf. Kartv. **berč'-/*barč'-* 'barren': Geo. *berc'-i*, Mingr. *burč'-i* (the Greek initial *s-* must then be regarded as a later expressive accretion).

Gk. *eskhárā* 'hearth; fire in hearth; altar', Myc. *e-ka-ra*: cf. Kartv. **čx-* 'burn, give off heat', **žē-čx-l-* 'fire': Geo. *cx-* 'give off heat, bake', *cx-el-* 'hot', *cx-ar-* 'hot, spicy; get excited, angry', *cecxl-i* 'fire'; Mingr.-Laz *čxe* 'hot', *dačxir-i*, *dačxur-i* 'fire'; Svan *šx-* 'burn, set fire' (the initial *e-* of the Greek form is then a prothetic vowel added in Greek).

Gk. **gúā* 'bend, distortion, bulge' (cf. *gúēs* 'bend of plow' > 'arable land', *gúalon* 'bulge, protuberance; concavity; concave plates of armor'): cf. Kartv. **q'ua-*: Geo. *q'ua* 'back; protuberant part (of tool, boat)', Svan *q'u(w)a* id., Mingr. *'va*, Laz *q'va*, *k'va* 'forehead'.

Gk. **maskhālē* 'underarm; shoulder' and the related *málē* id. (only in the expression *hupò málēs* 'secretly, by stealth'): cf. Kartv. **mqar-* 'shoulder': Geo. *mzar-i*, Mingr. *xuž-i*, Laz *mxuž-i*, Svan *meqār* (with expressive diminutive alternation in Greek: *-skh-* instead of *-kh-*).

Gk. *dágklon · drépanon* (Hesychius) 'sickle, scythe, curved knife', *zágklon* id., *zágklion* = *skolión* 'curved, bent': cf. Geo. *i-dačv'-i*, *ni-dačv'-i*, *dlačv'-i* 'elbow', Mingr. *du'-i*, Laz *duč'u*, *durč'u* id.

Gk. *hūbos* 'hump, hillock', *hubós* 'hunchbacked, bent': cf. Geo. *ube* 'protuberance, bosom', Mingr. *(l)uba*, Laz *uba*, *oba* id.

Gk. *daidállō* '(I) finish, trim skilfully, work, decorate', *daídalos* 'skilfully, masterfully finished' (Hom. *poludaídalos*), with expressive reduplication, from **dai-dal-* < **dal-dal-(?)*; cf. Kartv. **tal-/*tl-*: Geo. *tl-/tal-* 'cut, work (wood, stone), clean (fruits)', Mingr. *tol-* id.

Gk. *nássō*, Att. *náttō*, aor. (Hom.) *énakse*, perf. mid. *nénasmai* '(I) squeeze, trample, crush' (**nag-*): cf. Geo. *nač'-* 'crush; pound (in mortar)' (no correspondences elsewhere in Kartvelian).

Gk. *iskhús* 'strength, power', *iskhurós* 'strong, powerful': cf. Kartv. **šxu-* 'be thick, large', **m-šxu-il-* 'thick, large': Geo. *gan-sxu-* 'get thick, large', *msxvil-* 'thick, large', Mingr. *šxu*, Laz *(m)čxu* id. (with prothetic *i-* in Greek).

Gk. *záphelos*, Hom. *epizáphelos* 'strong, ardent, hot': cf. Geo. *m-zapr-i* 'strong, sharp, intense, bitter, fierce' (no correspondences elsewhere in Kartvelian).

Gk. *zaroûn* · *katheúdein* (Hesychius) 'rest, lie, sleep'; the original base would be *zan-*, which can clearly be related to Proto-Kartvelian **žen-/žin-* 'lie, sleep' (cf. Geo. *m-žin-av-s* '(I) sleep', Laz *di-žin-u* 'went to bed') in its western variant with **a* vocalism: **žan-* (cf. Mingr. *žan-u(n)*, Laz *žan-s* 'lies').

Gk. *daúō* '(I) sleep', *édause* · *ekoiméthē* (Hesychius): cf. Kartv. **dew-/dw-* 'lie; lay, put', with **a* vocalism in full grade **daw-*, which would have been characteristic of the West Kartvelian dialect area (with later expansion of the zero-grade form **dw-* to the entire paradigm in Mingrelian and Laz): see Gamkrelidze and Mačavariani 1965:221-22).

Gk. *gaméō* '(I) get married', Hom. *gámos* 'wedding, marriage'; *gambrós* 'affinal relative; sister's husband, wife's brother', and others: cf. Kartv. **km-ar-* 'husband': Geo. *kmar-i* 'husband', Mingr. *komonž-i*, Laz *komož-i* id.

Gk. *óar* 'wife' (from **ówar?*), whence *oarízō* '(I) court, pay compliments to, am in intimate relations with': cf. Kartv. **q'war-*: Geo. *q'var-* 'love', Mingr. *'or-*, Laz (*q'*)*or-* id.

Gk. *báskein* · *kakologeín* (Hesychius) 'talk badly, talk scandal, bewitch, slander', *báskanos* 'invidious, slanderer': cf. Kartv. **bežy-/bažy-*: Geo. *bezy-* 'report, tell on, slander', Mingr. *beržy-el-* 'shout', Laz *bežy-* 'get angry; scold, swear' (the Greek form obviously reflects the Proto-Kartvelian stem with West Kartvelian **a* vocalism).

Gk. *ákma* · *nēsteía*, *éndeia* (Hesychius) 'fasting; insufficiency, need', *ákmēnos* 'one who has not eaten': cf. Kartv. **q'm-* 'hunger; be hungry, starve': Geo. *si-q'm-il-i* 'hunger', Mingr. *'um-en-i*, Laz (*q'*)*om-in-* 'thirst', Svan *q'm-* 'be hungry, starve' (the Greek form has prothetic *a-*).

Gk. *kúllaíos* · *bóstrukhos* (Hesychius) 'locks, curls': cf. Geo. *k'ul-ul-i* id. (no correspondences elsewhere in Kartvelian).

Gk. *godān* · *klaíein* (Hesychius) 'sob, cry, bewail', cf. Geo. *god-eb-a* 'wail, crying' (without correspondences elsewhere in Kartvelian).

Gk. **tādos* 'wish, desire', presumed stem for Hom. *epitēdēs*, Dor. *epitādēs* 'with the intention, with the purpose, on purpose', hence *epitēdeúō* '(I) try, look after, take care to, do intentionally': cf. Kartv. **ē'ad-* 'wish, desire': Geo. *c'ad-* 'wish, be eager', *c'ad-il-i* 'wish, desire', Svan *hadw* 'wish, want'. This set is highly problematic.

The numerous lexical resemblances between Greek and Kartvelian, found precisely among the 'pre-Greek' words of non-Indo-European origin,²¹ are to be interpreted as showing that a number of Kartvelian words were borrowed by

21. Furnée 1979:19ff. lists over 100 such Greek-Kartvelian lexical resemblances. Those we consider to be the most plausible Kartvelianisms in Greek are cited above; the others can be put aside as formally or semantically dubious.

Greek while the Greek and Kartvelian tribes were in contact somewhere in the Near East during the Greek migrations from the proto-homeland westward to historical Greek territory. On the other hand, some of the forms mentioned in II.11.3.3 as Proto-Indo-European words in Kartvelian could equally well be attributed to Greek and regarded as prehistoric borrowings from Greek into Kartvelian. They would then show that the Greek-Kartvelian borrowings went in both directions. An example is Kartv. **km-ar-/ *kṃ-r-* 'husband' beside Gk. *gambrós* 'daughter's husband'.

The same Greek-Kartvelian historical contacts may be reflected in the well-known Greek myth of the Argonauts. The oldest stratum of this myth, which tells of the arrival of Phrixos on a flying ram and a fleece hanging in a sacred oak tree, reflects the arrival of the Greeks in Colchis in the second millennium B.C. (see Lordkipanidze 1979). The custom of placing a ram's fleece in a sacred tree (an oak in particular) was preserved among the western Kartvelian tribes until recent times (see Bendukidze 1973, Popko 1974:228-29, 1978:114ff.), and goes back to a ritual shared throughout this area, including northern Asia Minor, of placing a sacral ram's fleece in a sacred tree (cf. the tree *Gišeya*-22 in Hittite ritual tradition: see II.3.1.4.4).

Late versions of the myth of Jason (Gk. *Iásōn*, *Iēsōn*) and the Argo (Gk. *Argō*: Odyssey 12:70) would seem to suggest that the Greeks first arrived in Colchis from mainland Greece by a sea route through the Sea of Marmara, the Bosphorus, the Dardanelles, and the Black Sea. However, such a route is implausible for that time, since the Sea of Marmara (the ancient Propontis, i.e. 'before the Black Sea') was not navigable in antiquity.²³

The possibility remains of an overland entry of the Greeks into Colchis, or more generally the Transcaucasus. A northward route to the Black Sea coast of the Transcaucasus, in the course of the overall westward migration from the Indo-European homeland, would have provided such an entry. It is there that the Greek tribes could have come into contact with Kartvelian, specifically western Kartvelian, tribes who had already moved to the coastal regions of the Transcaucasus. The western Kartvelians apparently called their country Arg(o), as can be inferred from the self-designation of the western Kartvelian tribes, *m-arg-al-i* 'Mingrelian', i.e. 'inhabitant of Arg-' (cf. the Georgian name for

22. There is a conspicuous coincidence of this word with the oldest name of the country of the Colchidians, Aia, mentioned in various versions of the Argonaut myth (see Urušadze 1970:28-29). The word 'Colchis' (Gk. *Kolkhís*) apparently arises later and is used (e.g. by Herodotus) parallel to the older name Aia: ...*es Aían te tēn Kolkhída* 'and to Aia, to Colchis' (see Kauxčišvili 1960:48-49).

23. The philosopher Straton (late fourth to early third century B.C., head of the Peripatetic school) mentions that 'the Euxine Sea (the Black Sea) formerly had no passage at Byzantium, but the rivers flowing into it broke through it by the force of their current and then the water poured into the Propontis (i.e. the Sea of Marmara and the Hellespont)...' (Latyšev 1947:182).

western Georgia, *Egr-is-i*). This name may explain why in later versions of the myth the Greeks who visited Colchis in search of the golden fleece are called Argonauts, i.e. 'sailors who have been in the land of Arg(o)' (S. S. Džikija, p.c.). Subsequently this word, which originally referred to the 'land of the golden fleece', was reinterpreted as the name of the center of the Doric tribal confederation *Árgos*, which took part in the historical migration of the Doric tribes. One of their sacred cultic regions continued to be the place *Argolis* (Beyen and Vollgraff 1947), a name highly reminiscent of the western Kartvelian self-designation.²⁴ All this gives reason to assume that the Doric tribes were among the Greeks who moved northward to Colchis and that they preserved the memory of their stay in the land of Arg(o), continuing to apply this name (which has no Greek etymology) to their later cult centers.

The second component *-naútēs* 'sailor' of the mythic name Argonaut must have been the result of later reinterpretation of the myth as the legend of a sea voyage to Colchis on a ship named Argo. This reinterpretation would have become possible after a sea route from mainland Greece to the Black Sea coast was established in historical times.

The basic Greek word for 'fleece', *kōas*, pl. *kōea* (also used of the golden fleece), has no satisfactory Indo-European etymology (see Chantraine 1968-1974:I.604) and must be regarded as a foreign borrowing. It appears in the earliest versions of the myth of the Argonauts and is attested in Homer (Iliad 9:661, Odyssey 3:38 et pass.) and even earlier in Mycenaean texts as *ko-wo* (i.e. *kōwos* = Gk. *kōas*: see Morpurgo 1963:166), with preservation of the intervocalic *-w-* lost in Greek. This Greek word, reconstructed as **kōw-a/o-*, can be regarded as a borrowing from Kartv. **t'q'aw-/t'q'ow-* (Geo. *t'q'av-i* 'hide, pelt, skin', Mingr.-Laz *t'q'eb-i/t'k'eb-i* id. from **t'q'ob-i/*t'k'ob-i*);²⁵ Greek simplifies the Kartvelian initial cluster *t'q'* to *k-* and reflects the western Kartvelian (Zan) **o* vocalism. This Greek alteration of the word follows regular laws affecting initial consonant clusters. In this instance it involved not metathesis, which occurs in most native Indo-European words in Greek (see I.2.6.4), but simplification analogous to forms such as Gk. *kaínō* '(I) kill' beside *kteinō* id.²⁶

Dating the origin of the myth of the Argonauts and the golden fleece to the

24. Hoenigswald (1980) segments out of this toponym a suffix *-ol-* also found in the place name *Aiolis* 'Aeolia'. He analyzes *Aiolis* as a derivative of the country name *Aia* and etymologizes *Aioleis* as 'inhabitants of Aia'.

25. The Mingrelian-Laz *e* vocalism is the result of Zan umlaut of **o* (see Gamkrelidze and Mačavariani 1965:160ff.). Later, Kartvelian **w* yields Mingrelian-Laz *b*: **t'q'ow-/t'k'ow-* > **t'q'ob-/t'k'ob-*. The result is a correspondence of Georgian *v* [w ~ v] to Mingrelian-Laz *b*; another example is Old Georgian *k'raw-* 'lamb', Mingr. *k'irib-* id. (cf. Klimov 1964:115).

26. A good illustration of this simplification of Kartvelian loans in Greek is the Greek rendition of the Kartvelian name of the Kura River, **m'k'war-/m'k'ur-* (Geo. *m'k'war-i*, gen. *m'k'wr-is*), as *Kūros*, *Kóros* (see Tischler 1977a:86), simplifying the Kartvelian cluster (*m*)*t'k'* to *k-* (see Džikija 1960).

second millennium B.C. is consistent with the evidence of the other Greek word for 'hide, pelt, fleece', *búrsa*, an apparent loan of Hitt. *kurša-* with the ritual meaning 'fleece', 'fleece of the Defender god' (LAMA KUŠ*kuršaš*: Popko 1974:226; attested in texts from cultic centers of northern Asia Minor in the Hattic area: the *purulli-* ritual, the myth of Telepinus, etc.: cf. Haas 1978).²⁷ This is one more confirmation of early contacts of the Greek tribes with non-Greek groups in northern Asia Minor and the Transcaucasus.²⁸

12.3. The ancient Balkan languages and their dialectal and areal correlation. Indo-European migrations through the Balkans

12.3.1. Phrygian and its relation to the Greek-Armenian-Aryan dialect community

The Doric dialect of Greek was evidently not the only member of the Greek-Armenian-Aryan dialect community to take a northwestern route from Asia Minor to the Balkans. In addition to the language of ancient Macedonia, which was closely related to the Greek dialects (see O. Hoffmann 1906, Tsopanakes 1970), Phrygian must be placed in this dialect group, as apparently must Albanian to the extent that it continues the Balkan dialects, which, judging from the fragments that have been preserved, go back to an ancient Indo-European dialect grouping.²⁹

Phrygian is known to us from a few inscriptions of the first half of the first millennium B.C., found in Asia Minor. It shows structural traits that link it with the dialects of the Greek-Armenian-Aryan area: an augment in verbal forms such as OPhryg. *edaes* = Gk. *éthēke* 'put, placed', cf. late Phryg. *estaes* = Gk. *héstēke* 'put, placed'; relative pronoun *ios* (cf. Gk. *hós*, Skt. *yáḥ*); prohibitive negation *me* (cf. Gk. *mē*, Skt. *mā*, Arm. *mi*), etc.: see O. Haas 1966, Diakonoff and Neroznak 1977:184, 193, Neroznak 1978:66ff.

27. The antiquity of the Hittite word is confirmed by its attestation in Old Assyrian tablets as *gursānum* 'bellows; leather vessel for liquids', cf. Ugar. *krsn* with the same meaning (Gelb 1969a).

28. In the light of these facts, the chronology accepted by Kartvelianists for the Proto-Kartvelian breakup needs to be reconsidered. Its beginning has usually been put at the first half of the second millennium B.C. when Svan separated out, followed approximately a millennium later by the breakup of Georgian-Zan unity (see Gamkrelidze and Mačavariani 1965:17, note 1). The discovery of Kartvelian loans in Greek with characteristic Zan vocalism shows that the Zan vowel shift (**e > *a*, **a > *o*) had already taken place by the second millennium B.C. This pushes the beginning of the Proto-Kartvelian breakup and the separation of Svan back at least to the third millennium B.C. (see also II.11.3.4n19).

This lowered chronology for the Proto-Kartvelian breakup agrees well with the time depth proposed here for the Proto-Indo-European and Proto-Semitic breakups, both no later than the fourth millennium B.C. (see II.11.1.2).

29. These dialects may also have included Thracian, which is known from isolated glosses and text fragments (see Detschew 1957, Georgiev 1958:112-45, Neroznak 1978:21ff.).

In addition to the isoglosses linking it with the Greek-Armenian-Aryan group, Phrygian also shows a number of archaic features, in particular in its phonology. Like Armenian, Germanic, and a number of other Indo-European dialects, it preserves the ancient structure of the three Indo-European stop series, reflecting Series I as unvoiced, II as voiced,³⁰ and III as voiceless aspirated: cf. Phryg. *tios* 'dei' beside Skt. *diváh*, Gk. *Diwós*; OPhryg. *edaes* = Gk. *éthēke*, Phryg. *thri-* 'three' (in *thríambos* 'three-step dance'). The possible status of Phrygian as a *centum* language with secondary palatalization³¹ before front vowels (e.g. *zemelō-*, PIE **ǵhem-*) places it among the dialects which eliminated the original palatalized velar series to merge it with the plain velar series.

A number of grammatical forms in Phrygian can be interpreted as evidence for links with dialects of another group, Hittite-Tocharian-Italic-Celtic: middle forms in *-tor* such as *addaketor* (from *dak-* 'place, do'), *abberetor* (from *ber-* 'carry'): see O. Haas 1966, Diakonoff and Neroznak 1977.

The Phrygians lived in the Balkans in historical times, as is confirmed both by the testimony of ancient authors³² and by archeological analysis of the cultures of the Balkans and Asia Minor.³³ From the Balkans they moved into Asia Minor at the end of the second millennium B.C., together with the 'peoples of the sea' of Egyptian sources, and became established there after the destruction of the Hittite kingdom around 1200 B.C.

12.3.2. Proto-Albanian and its original dialect relationships

On the basis of its phonetic and morphological features, Albanian can be assumed to have originally had affinities to the Greek-Armenian-Aryan dialect

30. There is indirect evidence that the Phrygian voiced stops, rendered in Phrygian writing with the Greek letters for *b*, *d*, *g*, may actually have been pronounced as voiced aspirates [b^h d^h g^h]. This is supported by fluctuations in Greek transcriptions of the name of the Phrygians: *Brúges*, *Bríges* as well as *Phrúges*. The Greeks rendered voiced aspirate [b^h] variously as *b* and as *ph* (see Porzig 1954:69-70 [1964:106]). Cf. the Greek rendition of Sanskrit *b^h* as *ph* in the name of the Kabul River (in Afghanistan): Gk. *Kóphēs*, *Kōphēn* beside Skt. *Kúbhā*. If this analysis of the Phrygian stops is correct, then we have complete identity in the Phrygian and Armenian reflexes of the stop series as unvoiced, voiced (aspirate), and voiceless aspirate.

31. Classical authors (Plato, *Cratylus* 410) testify to the similarity of the Phrygian word for 'dog' to Gk. *kúōn* 'dog'. On this evidence a form like *kúnes* can be proposed for Phrygian: see O. Haas 1966:166 (with references).

32. "According to the Macedonians, while the Phrygians lived together with them in Europe they called themselves *Bríges*. But after they settled in Asia, together with their location they also changed their name to *Phrúges*" (Herodotus, *Histories* VII.73).

33. Kurgan graves (and objects of material culture such as ceramics and bronze implements) in Bulgaria coincide exactly with a burial type found in the vicinity of Gordion and Ankara (see Akurgal 1961).

grouping, part of which left Asia Minor for the Balkans. Among these isoglosses are the genitive-dative plural in *-ve* < **-bhyos* (beside Skt. *-bhyah*, Arm. instr. pl. *-bk'*), prohibitive negation *mo-s* (beside Gk. *mē*, Arm. *mi*, Phryg. *me*, Skt. *mā*), and a possible trace of the augment (Alb. *hē-ngra* 'I have eaten', Arm. *e-ker* 'he ate'): Pisani 1959:110ff.

Once in the Balkans, Proto-Albanian was subject to the strong influence of the Ancient European dialects that subsequently arrived in the area. This led to significant changes in its lexicon and especially in its grammatical structure, thus removing it from its original structural type, which was close to that of the Greek-Armenian-Aryan grouping. For the linguistic type of Proto-Albanian after the time of Ancient European influence see Desnickaja 1968, Solta 1980.³⁴

12.3.3. Balkan culture in the fifth to fourth millennia B.C. and its connection with Asia Minor (Çatal Hüyük)

Even before Indo-Europeans arrived there from Asia Minor, the Balkans were an ancient center of civilization in Europe, with roots going back to the fifth millennium. Archeological discoveries in recent years have revealed a highly developed civilization in the Balkans, close in type to ancient Oriental civilization and with connections to the even earlier civilization of western Asia Minor, that of Çatal Hüyük in the sixth millennium B.C.

The culture of the fifth- and fourth-millennium Balkans (Starčevo in Yugoslavia, Karanovo I in Bulgaria, Criș in Rumania, Körös in Hungary, Sesklo in Thessaly) is characterized by developed agriculture and the use of grains of Near Eastern origin (Timov 1966), copper metallurgy, probably also developed under the 'influence of Asia Minor (Ryndina 1971), and a fairly complex religion and its attendant symbolism, including pictographic marks of a linear nature (see Rosenkranz 1975:10ff., Gimbutas 1973a:13, 1974, Birnbaum 1974:363ff.).

The fact that this culture belongs both typologically and genetically to the Near Eastern area can be interpreted as evidence that it was an early offshoot of the Southwest Asian center of civilization. Identification of the ethnic affiliation of ancient Balkan culture, or for that matter that of Çatal Hüyük, is not possible at present. Later, apparently beginning in the third millennium B.C., this ancient Balkan culture was submerged by migratory waves of Indo-European speakers emanating from the Proto-Indo-European area in the Near East.

34. The proposed eastern Anatolian origin and Greek-Armenian-Aryan dialect affinity of Albanian lend interest to the coincidence in names of the (Balkan) Albanians (Gk. *Albanot*) and the Caucasian Albanians who inhabited the (Transcaucasian) *Albania* of Greek sources (see Pisani 1959a:111).

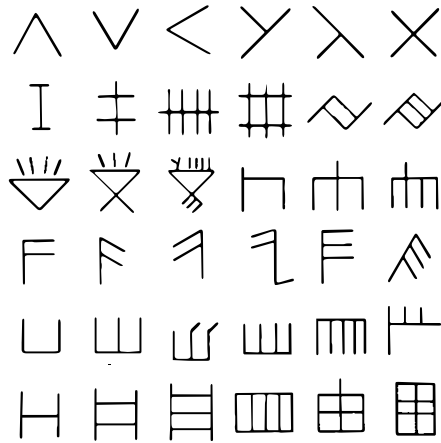


Illustration 19.

Linear signs of the ancient Balkan script, 7th–6th millennia B.C.
(after Gimbutas 1973a)

12.4. Proto-Armenian and its original expansion routes

12.4.1. *Contacts of Proto-Armenian with Hittite and Luwian. The language of the land of Hayasa*

A Near Eastern homeland for Proto-Indo-European requires relatively little movement of Proto-Armenian, which remained in Asia Minor where it could have come into contact with the Anatolian linguistic world. From there the Proto-Armenians spread to historical Armenia and overlaid a Hurrian-Urartean substratum (see Diakonoff 1961:366ff., 1968). Contacts of Proto-Armenian with Hittite and Luwian are confirmed by a number of Armenian borrowings from the Anatolian languages:

Arm. *ap-ašxarel* 'repent, redeem guilt with tears', *ašxar* 'weeping'; cf. Hitt. *ešhaḫru-* 'tears', *ešhaḫruwa-* 'weep'.

Arm. *spand* 'sacrifice, offering'; cf. Hitt. *išpant-* 'perform sacrificial libation'; and other words.³⁵

A special problem is posed by the relation of the Proto-Armenians to a country Hayasa (URUḪayaša-) mentioned in Hittite sources of the fourteenth to thirteenth centuries B.C. and located to the northeast of Asia Minor (see Kapancjan 1956). Whether the language of its inhabitants bore any relationship

35. For Anatolian loans in Armenian see Kapancjan 1956, Schultheiss 1961, Mkrtčjan 1976, Greppin 1978a, 1982.

to Armenian cannot be decided at present due to lack of linguistic evidence,³⁶ but it is at least possible to propose a connection of the toponym *Ḫayaša-* and the Armenians' self-designation *hay-*. An analysis of *Ḫayaša-* as *Ḫay-aša-* with the possessive suffix *-š(š)a-* finds confirmation in the existence of other toponyms with the stem *Ḫay-*. A city *Hayi* situated in the vicinity of the upper Euphrates is mentioned in a hieroglyphic Luwian inscription of the tenth century B.C. from Carchemish (Hawkins 1972); a city *Ḫayanu* on the Aman is mentioned together with Carchemish, Nairi, and Hatti in an inscription of Shalmaneser III (858-824 B.C.): see also Laroche 1966a:371. Even if we deny any genetic relationship between the Proto-Armenians and the inhabitants of Hayasa, and consequently between their languages, it is still plausible that there would have been interaction between these ethnic groups such that the Proto-Armenians could have taken over the name *hay-* as their ethnonym.³⁷

12.5. The breakup of the Indo-Iranian dialect community and the temporal and spatial relations of the various migratory waves of Indo-Iranian speakers

12.5.1. *Early Aryan dialects: Mitannian Aryan, Kafir, Indo-Aryan. The chronology of the settlement of Afghanistan and northwest India*

Reliable Aryan terms such as *aika-wartanna* 'one turn', *panza-wartanna* 'five turns', etc. (see II.3.1.1.3 above) confirm the presence of Aryan elements in the

36. The evidence is limited to twenty or thirty toponyms, names of people from Hayasa, and names of Hayasan gods (see Djahukian 1964:24-26). Even if such names were shown to be non-Armenian, that would not mean that the language of the Hayasans was not Armenian. Onomastics frequently fails to reflect the actual linguistic affiliation of a country. For instance, if our sole evidence for Hittite were onomastics of the Neo-Hittite kingdom, rich as that is it would be almost impossible to conclude from it that Hittite was an Indo-European language. It should be noted that positive onomastic evidence can be justification for determining the affiliation of a country's language, while negative evidence cannot disprove the existence of the given language in the territory in question.

37. Deriving the ethnonym *hay-* from the toponym *Hatti* (cf. LÚ URU*Ḫatti* 'person from Hatti') of the Hittite sources (see Diakonoff 1968:234ff.) is less convincing, since it assumes that the Proto-Armenian change of *VrV to VyV (cf. PIE *p^h*H*ter- > Arm. *hayr* 'father', PIE *mā^hter- > Arm. *mayr* 'mother', and others) continued to operate even after the proposed Proto-Armenian borrowing of *ḫat(t)i* (actually 'inhabitant of the land of Hatti') as a self-designation. The claim would be more plausible if evidence from other borrowings had been given showing the application of the Armenian sound law in historical times. But in any event, either etymology of *hay-* requires borrowing of the name by the Proto-Armenians in the western regions of Southwest Asia and a subsequent eastward movement to the historical territory in the Armenian uplands, where they overlaid the pre-existent Hurrian-Urartean ethnic element.

For more on the Armenian homeland and the place of Armenian in Indo-European see the series of contributions on the ethnogenesis of the Armenians in *Vestnik Obščestvennyx Nauk* (Armenian Academy of Sciences) 1980, nos. 5, 6, 8, 9, and 1981, no. 2 (articles by Širokov, Xačatryan, Klyčkov, Greppin, Mnacakanjan).

Near East as early as the middle of the second millennium B.C. Hurrian-Aryan interaction can be regarded as the first historically attested instance of contact between an Indo-European dialect and a non-Indo-European language in close chronological and geographical proximity to the Proto-Indo-European homeland we propose. In Hurrian we find a word for 'horse', *ešši* (Laroche 1978:85), obviously of Indo-Iranian origin (from PIE **ek̑hwo-*, already with *satem* spirantization of the palatovelar).

The *satem* Indo-Iranian word for 'horse' (Skt. *áśva-*, Avest. *aspa-*, OPers. *asa-*) also entered a number of ancient Near Eastern languages: Sum. *sí.sí*, Akkad. *sisû* 'horse', Ugar. *ssw*, Hebr. *sûs* (cf. Egypt. *śśm.t* 'horse'): see II.3.1.1.18. This shows that Indo-Iranian had separated out of the Greek-Armenian-Aryan dialect community and begun its contacts with a number of Near Eastern languages, especially Semitic, at a very early date.³⁸

It is significant that the Anatolian languages give no evidence of contact with Indo-Iranian and vice versa. This is evidence of an early break between Anatolian and Aryan dialects within Indo-European and their early movement in different directions with no subsequent contact between them.³⁹

The eastern edge of the Proto-Indo-European territory — the northern part of the Iranian plateau — must have been the historical Indo-Iranian area. According to archeological evidence, the appearance of Indo-Iranian tribes in northern Iran is to be dated to the first half of the third millennium B.C. (the Hissar IIB culture): Thomas 1970:200-201. A gray ceramic ware that appears at that time in northern Iran is comparable to the gray Minyan ware of western Anatolia (12.2.1 above; see also Deshayes 1960, 1969). From here the first waves of Aryans would have moved further east through Afghanistan to northwest India.

One of the first such waves is reflected in the historical Kafir (Nuristani) languages, which preserve archaisms from the early Indo-Iranian period: no assibilation of palatals (cf. Kafir *ćuna* 'dog' beside Skt. *śuvā́*, Kafir *duć* 'ten' beside Skt. *dáśa*); no shift of *s* to *š* after *u* (cf. Kafir *mūsə* 'mouse' beside Skt. *mūś-*, etc.): see I.2.3.3 above. It must be assumed that the Aryan dialect from which the Kafir languages evolved separated from Proto-Aryan very early and was the first to move eastward to the borders of historical India (see Morgenstierne 1975). Subsequent migratory waves of Indo-Aryans pushed them to the north, into the inaccessible mountain valleys where the 'Kafirs' live to the present day (Burrow 1955 [1976:35]).

38. The lexical evidence for contacts of Indo-Iranian with Semitic increases the plausibility of Szemerényi's hypothesis (1964a; see also 1977:362ff.) that the merger of Proto-Indo-European **e*, **o*, and **a* to Indo-Iranian *a* is due to the influence of Semitic languages with their triangular vowel systems /i a u/.

39. This does not pertain to Aryan words in Hittite texts of Hurrian origin; they testify to Hurrian-Aryan contacts, not Hittite-Aryan ones.

The eastward movement of the ancient Indo-Aryan tribes is also reflected in mythic conceptions of the east as connected with forward movement, the west as behind, and the south as to the right: Skt. *pūrva*- 'front, going in front' and 'eastern', *paścā* 'back(wards)' and 'western', *dākṣiṇa*- 'right' and 'south'. Such a view could naturally have arisen in a tribe moving eastward: the east would be ahead, the west behind, the south to the right, and the north to the left.⁴⁰ Movement of the ancient Indic tribes from the Iranian plateau to the east toward historical India is also reflected in the archaic hymns of the Rigveda, which mention names such as *Dāsa*, *Hariyūpiyā*, and others which indicate that old Indic tribes once lived in southeastern Iran and Afghanistan (see Toporov 1962:63, Burrow 1973).

The entry of the Indic tribes into northwest India is associated archeologically with the appearance of cremation (Stacul 1971) and is dated to the second half of the second millennium B.C. The fall of the ancient Indus Valley cities Mohenjo-Daro and Harappa dates to approximately this time, and many scholars consider them to have been destroyed by the entering Indic tribes (Heine-Geldern 1956, Fairservis 1956, Kumar 1973). Contacts between Sanskrit and the pre-Aryan languages of ancient India — Dravidian, Munda, and others — began at this time (see Burrow 1955 [1976:348-61], Kuiper 1948, Kirfel 1953).

Population-genetic consideration of inherited immunological properties gives another perspective on the hypothesis of an eastward migration into India. For Asia Minor and the other eastern Mediterranean countries a correlation is assumed between the range of malaria (from southern Greece and Asia Minor eastward to Hindustan) and a hereditary variant of the hemoglobin molecule which triggers sickle-cell anemia: the sickle-cell gene under heterozygous conditions increases the organism's resistance to malaria (Harrison et al. 1979:284-90, 572). This hereditary factor took on particular significance with the spread of agriculture, when moist forests began to be cleared for fields, leading to an increase in the number of mosquitoes (see Angel 1940). If the ancient Indic tribes entering Hindustan had not had genetic resistance to malaria, they could not have survived there. Hence an entry into India from the west, from the Southwest Asian sickle-cell area, is more plausible than the traditionally assumed southward migration from Central Asia, where there is no sickle-cell anemia.

Further evidence for this is the nature of skeletal remains of the ancient population of these regions. According to recent craniological data, a recurrent cause of death in the population of regions such as the Indian subcontinent (in particular the ancient cities of Proto-Indic civilization Mohenjo-Daro and Harappa) and some of the southernmost parts of the European continent (the

40. In Sanskrit, *śavyā*- 'left' does not mean 'north', which can be explained as due to tabooing of the meaning 'north' and frequent fluctuations in the meanings of this word (cf. *dākṣiṇa*- 'right' and 'south').

southern extremities of the Peloponnesian and Apennine peninsulas) was the aftereffects of malaria epidemics, which triggered defects of bone tissue in the skull (porotic hyperostosis) in broad segments of the population. Significantly, almost all of the pre-Indo-European population of these regions had precisely this type of skull (see Kennedy 1981).

It is highly likely that the Indo-Aryan tribes arriving in Hindustan and the Greek and Italic tribes arriving in the southern parts of Europe, who do not display such craniological characteristics, had hereditary immunity to malaria and its lethal consequences. Such an immunity could have been acquired only in the area where tropical malaria is found, which excludes all of the northern part of the original range of the Indo-European tribes in Eurasia (for a map showing the distribution of tropical malaria see Harrison et al. 1979:570).

12.5.2. *Traces of an Aryan dialect in the northern Black Sea area and the problem of Indo-European migrations over the Caucasus*

Traces of Aryan tribes and names are also found in the northern Black Sea area in the Kuban region, as well as in the vicinity of the Caspian. These Aryan words, more archaic than the later Iranian forms,⁴¹ include the river name *Sindes* and the tribes *Síndoi*, *Sindoi* (in classical sources; cf. Skt. *Síndhu*- 'Indus River; India'); the Kuban River (*Cuphis*, *Koûphis*, cf. Skt. *Kúbhā* 'Kabul River' in the Rigveda); the Caspian tribe *Daš*- (cf. Skt. *Dāśa*, *dāsyu*- 'foreign tribe', OPers. *dahyu*- 'province, district'): see Kretschmer 1943 (1944); cf. Uslar 1881:451, Thumb and Hauschild 1958:I:1.87, Trubačev 1976; Trubačev 1977 gives a list of names from this region with possible Indo-Aryan etymologies.⁴² The isolated location of these places north of the Caucasus gives reason to assume that Aryan tribes entered the area from the Near East via the Caucasus.

On archeological grounds the breakup of Indo-Iranian unity dates to no later than the end of the fourth millennium B.C., since it can be established that from that time until the beginning of the first millennium B.C. the Indo-Aryans had no contact with East Iranian tribes (see Ghirshman 1977:45, 70, 73). This archeologically based conclusion agrees perfectly with the view just proposed of independent migrations by various Indo-Iranian tribes (Indo-Aryans, Mitannian Aryans, Kafirs, Iranians) beginning in the fourth millennium B.C. During this same period one branch of Indo-Aryans could have penetrated to the North Caucasian steppe, evidently via the Caucasus.

41. The greater archaism of these forms relative to their Iranian cognates can be seen in their voiced aspirates and the sibilant *s*-, which changed to *h*- in Iranian. This shows the early Proto-Indo-Iranian or dialectal Aryan (or in any case Indo-Aryan) nature of these words.

42. However, see Eilers and Mayrhofer 1960 for objections to Kretschmer's comparisons.

Thus by the end of the fourth millennium and beginning of the third millennium B.C. various Aryan dialects, one of them fixed in documents of the mid-second millennium B.C. in the form of Mitannian Aryan, were spread south of the Caucasus through the original Indo-European territory. Speakers of these dialects, equipped with chariots and horses, were capable of making long journeys. Some of them traveled eastward to Afghanistan and India; some went west (the Mitannian Aryans); others went north and south.⁴³ A journey northward would have brought Aryan tribes through the Transcaucasus to the North Caucasus.

Further evidence for movements of Indo-European tribes to the North Caucasus comes from archeology. As early as the second half of the fourth millennium B.C. the early Maikop culture on the Kuban shows a whole complex of traits uniting it with the ancient Near Eastern culture of Amuq F-Gawra, which covered the area to the south of the Transcaucasus from Lake Van and Cilicia in the west to Lake Urmia in the east. The claim for a link of Maikop finds with late Eneolithic cultures of Southwest Asia is based on analysis of material culture and art. The connections are interpreted archeologically as evidence for migration of a Near Eastern group through the Transcaucasus to the North Caucasus (see Andreeva 1977).⁴⁴ The interpretation of the movement as northward through the Transcaucasus rather than southward from the Black Sea to the Near East is based on the chronology of the material artifacts, which unambiguously spread from Southwest Asia. This in itself is sufficient grounds for regarding the earliest Indo-European migrations in these regions as having involved movement from the Near East through the Transcaucasus to the Black Sea and Caspian steppes and not vice versa.⁴⁵

43. In this connection it is significant that a number of personal and place names in Syria and Palestine can be etymologized as Indo-Iranian (see Burrow 1955 [1976:30]). Note also the name of the Jordan River (Hebr. *Yardēn*, Egypt. *jrđn*) with its second element *-dan*; cf. also the name *Radānu* of an eastern tributary of the Tigris (Rosenkranz 1966:136; see also Tischler 1977a:11).

44. As early as 1881 Usilar pointed out the possibility of an ancient advance from Southwest Asia via the Transcaucasus into Daghestan. Linguistic traces of just such a movement can be seen in Daghestanian words of Indo-European origin; see below.

45. If instead the direction of migration is assumed to have been from north to south, then the division of Proto-Indo-Iranian into Indo-Aryan and Iranian would have had to take place in the northern Black Sea area (the traditionally assumed Indo-European homeland), with the Indo-Aryan and Iranian tribes migrating independently from this area to their historical territories. But this removes the possibility that Indo-Iranian linguistic unity existed in Central Asia, where the Indo-Iranians, according to this assumption, went from their supposed Black Sea homeland. This view, supported by some investigators (Diakonoff 1956:124, M. D'jakonov 1961:42, Litvinskij 1964, Grantovskij 1970, Smirnov and Kuz'mina 1977), amounts to identifying the ancient population of the Central Asian steppe, specifically the Andronovo culture, as the speakers of Proto-Indo-Iranian, with the subsequent breakup of this linguistic community in Central Asia and the entry of Indo-Aryan dialect speakers into the Indian subcontinent via the Hindu Kush (see also Šer 1980:210).

The weakest point in this argument is the identification of the Andronovo culture with Proto-Indo-Iranian (on this question see Sarianidi 1977:149), not to mention the difficulty that

Evidence for the movement of Indo-European speakers, and specifically Indo-Aryan speakers, to the Transcaucasus and the North Caucasus can be seen in a number of words from Caucasian languages which show resemblances to *satem* Indo-Iranian forms:

Geo. *ačua* 'horse' (in children's language), *aču* (interjection for urging horses on); Abkhaz, Ubykh (*a*)čy 'horse'; Avar, Lak *ču*, Akhvakh *ičwa* 'horse', Andi *iča* (see Giginejšvili 1977:91), with a reflex of Indo-European palatal **ḱh* preserving an affricate *č; cf. Skt. *ásva-*, Avest. *aspa-*, OPers. *asa-* with spirantization of the affricate.

Kartv. **qarq-*/**qrq-* 'throat, gullet': Svan *qarq-*, Geo. *qorq-*, Mingr.-Laz *xurx-*: cf. Skt. *kṛkāṭam* 'vertebra of neck', *kṛkaḥ* 'throat' (of unclear etymology: see Mayrhofer 1956:I.256), see Djahukian 1967a:71. The word may represent an Indo-Iranian dialectal lexeme, close in form and meaning to the Kartvelian one.

Kartv., Geo. *parto* 'wide': cf. Skt. *prthú-* 'wide' beside Avest. *pərəθu-*, Arm. *layn*, Gk. *platús* id. (in this instance a borrowing from Old Iranian is also formally possible).

Kabard. *ažǎ*, Adyghe *ačǎ* 'male goat, stud goat' (Šagirov 1977:I): cf. Skt. *ajā-* 'goat' (Dumézil 1963:17). The Northwest Caucasian form reflects the *satem* nature of the Indo-Iranian word.

Abkhaz *gu-* 'cattleyard' in words such as *a-gu-p* 'herders (as collective)', *a-go-arta* 'herd' (Bžanija 1973:85); cf. Skt. *gu-*, *gav-* 'bull, cow'. The same Indo-Iranian source can be assumed, although this word cannot distinguish *centum* from *satem* dialects.

The Northeast Caucasian word for 'silver', which reflects a *satem* form of PIE **Hark̑-*, may also belong to this group: Avar *šarac*, Andi *orsi*, Akhvakh *ači* < **arči*, Lak *arcu*, Dargi *arc*, Tabassaran *ars*, Archi *arsi*; cf. Skt. *árj-una-* 'light, silvery-colored', *rajatám* 'silver', Avest. *ərəzata-*, cf. Arm. *arcat*, Gk. *árguros* (see Lafon 1933:90-95, Giginejšvili 1977:90-91).

Proto-Daghestanian **mVǵVr*/**mVčVr* 'beard': Lezghi *ččuru*, Tabassaran *mižir*, Agul *mužur* with voicing of the consonant, beside the glottalized affricate of Dargi *muc'ur*, Lak *č'iri*, Archi *moč'or*, Rutulian *mič'ri*, Caxur *muč'ru*, Xinalug *mič'eš* (< **mič'eri*): see Giginejšvili 1977:135. The Daghestanian form shows clear similarity to *satem* Indo-Iranian forms such as Skt.

large masses of population would have in surmounting the extremely high Hindu Kush massif to enter India (note that the linguistically related Kafirs settled in Nuristan on the northern spurs of the Hindu Kush). Nor is it clear, if the Proto-Indo-Iranian community was located in Central Asia, how the undeniable evidence for specifically Indo-Aryan languages — linguistically distinct from Iranian — in the Black Sea area and the Near East (the Mitannian Aryans) is to be explained.

But even if the existence of an Indo-Iranian dialect unity in Central Asia is maintained, it still accords better with a Southwest Asian Proto-Indo-European homeland than with a northern Black Sea proto-homeland, which presents the insuperable factual difficulties mentioned above, difficulties which do not arise with a Southwest Asian Indo-European homeland.

śmáśru- 'beard' < **smok^hru-* (beside the *centum* form of Hitt. *zamankur* 'beard', where a sequence **-k^hur*, similar to the final syllable of the Daghestanian form, must have preceded the shift of **-k^hu-* to *-šu-* in Anatolian; cf. also the reflex of palatal **k^h* as *k* before sonant in Lith. *smakrà*, Alb. *mjékër* 'beard').

In summary, the original Indo-Iranian dialect community, after its separation from Greek and Armenian, must be placed somewhere in Southwest Asia. It subsequently differentiated into Indo-Aryan and Iranian branches, and its early dialect groups left the Near East to enter adjacent areas, including the North Caucasus.

12.5.3. *The separation of the Iranian dialects from the Aryan dialect community. Traces of East Iranian settlement in Central Asia and Afghanistan*

Evidence for a separate dialect group within Indo-Iranian, one which subsequently provided the foundation of the Iranian languages, can also be observed in the archaic hymns of the Rigveda. They contain a number of Iranian hydronyms, toponyms of southeastern Iran and Afghanistan, and personal names with diagnostically Iranian phonetic features. One example is *Hariyūpīyā*, identified with the Iranian name *Haliāb* or *Ariob* in Afghanistan (see II.11.1.2 for Indo-European river names with a second element **Hap^h-* 'water; stream'). Another is the Sanskrit personal name *Kuruṅgāḥ*, lit. 'the one who crossed the Kurush', beside the Iranian hydronym *Kūruš*. There are personal names such as *Vṛcayā-*, *Svanāya-*, and others. For such words see Toporov 1962:63 et pass.

An Iranian-speaking population is known from historical western Iran by no later than the tenth century B.C. (and possibly much earlier): see Grantovskij 1970.⁴⁶ The Avesta, composed at the end of the second or beginning of the first millennium B.C., describes the settlement of the eastern Iranians in regions of Central Asia and Afghanistan: Avest. *airyanəm vaējō* (later *ērān-wēz*) 'Aryan space' (the lower Amu-Darya and the Khwarezmian oasis), described in the Avesta as 'the first and best of the places and countries created for the Iranians' (Benveniste 1934), *gava-* (the Greek Sogdiana), *maryav-* (the Merv oasis, Greek Margiana), *bāxδī-* (Bactriana, the southeastern part of Central Asia and northern Afghanistan), *nisāya-* (Nisaya, in Central Asia), *haraiva-* (the Herat region in northern Afghanistan), *vaēkarata-* (the Kabul valley in Afghanistan), *haraxvaiti-* (Arakhozia, southern Afghanistan), *haētumant-* (central and southwestern Afghanistan), and others: see Spiegel 1979:I.26, 33, Oranskij 1960:57-60.

46. For the various views on the entry routes of Iranian-speaking tribes into Southwest Asia, see P'jankov 1979.

The historical movement of the Iranian-speaking tribes in a southward direction, possibly toward Afghanistan, is evidently reflected in the conception of the south as forward or ahead: Avest. *paurva-* 'south; ahead' (cf. the cognate Skt. *pūrva-* 'front, forward' and also 'east', reflecting eastward movement). On the other hand, there were also intensive migrations of Iranian-speaking tribes, especially East Iranians, through Central Asia and the northern Caspian steppes (see Smirnov and Kuz'mina 1977) to the North Caucasus and the Crimea. These movements are reflected in Iranian hydronyms in eastern Europe such as Don, Dnieper, Dniester, Danube (see II.5.3.2), and in later archeological data showing close affinity of the Scythians of the Crimea and those of the Altai Mountains (Rudenko 1961).

Recent archeological finds in northern Afghanistan (ancient Bactria) testify to movement of the Indo-Iranian tribes to their historical territories from the west, via the Iranian plateau, and not from the north via Central Asia. Ancient archeological links of north Afghan Bronze Age cultures with those of Southwest Asia are clear evidence for this (see Sarianidi 1977:5, 83, 90, 145ff.).

12.5.4. Early evidence of Iranian migrations to Central Asia. The oldest Iranian loans in Finno-Ugric

Even earlier evidence for migrations of the Iranian-speaking tribes northward and westward through Central Asia can be seen in numerous lexical borrowings in Finno-Ugric languages. These Finno-Ugric words are specifically early Iranian, not Aryan and above all not Sanskrit. They show phonological features characteristic specifically of early Iranian immediately after its split from the Aryan dialect community.

Finno-Permian **reśmā*: Lapp *ræš'me* 'thin cord', Mordvin (Erzja) *riś'me* 'chain', (Moksha) *riś'me* 'rope'. Borrowed from an Iranian source with a later shift of *a* to *æ* as in Oss. *rætæn* 'thick rope' (from **raθana-*: Abaev 1973:II.382-83), mod. Pers. *resen* beside *rasan* 'rope, cord' (cf. Skt. *raśanā* 'rope, strap, belt, bridle'). Therefore there is insufficient evidence for regarding the Finno-Permian form as reflecting a Pre-Aryan **reśm-* with original Indo-European vocalism (see Joki 1973:308).

Finno-Perm. (or Finno-Ugric) **porśas/*porčas*: Finn. *porsas* 'pig', Veps *porzaz*, Est. *põrsas*, Liv. *puoraz* 'pig', Mordv. (Erzja) *purtsos*, (Moksha) *purts* 'pig', Komi-Zyr. *porś* 'pig', Votyak *parś* 'pig' (Lytkin and Guljaev 1970:226). From early Iranian with Finno-Ugric **o* as a reflex of **a* before **r*; cf. Khotanese Saka *pā'sa* 'pig' < **parsa*, Kurd. *purs*, Lat. *porcus* 'domestic pig', Mlr. *orc* 'pig', Lith. *pařšas* 'piglet'.

Proto-Perm. and Ugric **śarsa/*śasra*: Votyak *śurs* '1000', Komi-Zyr. *śurs* '1000', cf. Vogul *sōtār* '1000' (Joki 1973:318). Borrowed from early Iranian

with later metathesis: PIE **ǵheslo-* > Proto-Iran. **džasra-* > **žasra-* > **žahra-*, cf. Sogd. *z'r*, Pashto *zər*, Arm. *hazar*, Khotanese Saka *ysāra-*, Avest. *hazaŋrəm*, Pehlevi and mod. Pers. *hazār*, with metathesis of *h* and *z*. The Finno-Ugric form is from early Iranian with a palatal spirant. In contrast to the Iranian form, Skt. *sahāsram* '1000' is distinguished by an initial addition *sa-*, lacking in Finno-Ugric.

Proto-Perm. **sarid'z* < **džaris*: Votyak *zarid'ž*, *zariž* 'sea', Komi-Zyr. *sarid'ž* 'sea; warm lands where migratory birds go; warm sea', cf. *sar* 'sea', *Sar-dor* 'lower Pechora region' (lit. 'region near the sea'). An early Iranian loan reflecting a palatal affricate from an Indo-European palatal, cf. Avest. *zrayō*, *zrayah-* 'sea', OPers. *drayah-* 'sea', Pehl. *zrēh* [zlyh] 'sea, lake', Parth. *zryh* 'sea' (cf. Skt. *jrāyāḥ* 'motion, fleeing'): Joki 1973:349, 310; Lytkin and Guljaev 1970:249.

Finnic **punta*: Cheremis *pündakš*, *pāndaš* 'bottom', Votyak *pides* 'bottom', Komi-Zyr. *pides* 'bottom'. From early Iranian, cf. Avest. *būna-* < **bundna-*, Pehl. *bun*, mod. Pers. *bun* 'bottom', Khotanese Saka *buna* 'ground', Oss. *byn/bun* 'foundation, bottom' (cf. Skt. *budhnāḥ* 'bottom', Pali *bunda-* < **bundha-* 'root', Lat. *fundus* 'ground'): Joki 1973:304-5.

Proto-Perm. **kurʒg* 'chicken': Votyak *kureg* 'chicken', Komi-Zyr. *kureg* 'chicken' (Lytkin and Guljaev 1970:147). Borrowed from Iranian, cf. Parachi *kury*, Pashto *čərg* 'rooster', *čərga* 'hen', mod. Pers. dial. *kārgə* 'domestic fowl; chicken', Oss. *kark*, Pehl. *kark*, Avest. *kahrka-* 'chicken' (*kahrkāsa-* 'kite' < 'chicken-eater'): Joki 1973:276. The Permian -*g* can be explained by the form in -*g*, **karg*, that underlies the Ossetic and Persian forms (Abaev 1958:I.572).

Proto-Finnic **aiva*: Finn. (arch.) *aiva* 'only, exclusively, entirely', Est. *aiva*, *aeva* 'only'. From Iran. **aiva-*: OPers. *aiva-* 'one', Avest. *aēva-* 'one; only; one or another' (cf. Skt. *evā* 'thus, exactly so, only', Gk. *oīwos* 'only'). There is no formal justification for regarding the Proto-Finnic word as a loan from Proto-Indo-Iranian: cf. Skt. *éka-*, Mitannian Aryan *aika-* 'one'. It is a specifically Iranian loan (as Joki 1973:247 also considers possible).

Proto-Finnic **aiša* 'shaft': Mordv. (Erzja) *ažija*, *ažja*, (Moksha) *ažje* 'shaft', Votyak *uajžž* 'shaft', Komi *vož* 'shaft'. Formally more comparable to early Iranian **aiša-* (Avest. *aēša-* 'plow') than to Skt. *īśā* 'shaft', Hitt. *hišša-*, PIE **Hois-* : **His-* 'shaft' (see Joki 1973:253-54). The meaning 'plow' historically attested in the individual Iranian languages is a development of the original Indo-European meaning.⁴⁷

Fi-U **ertä*: Lapp **ær'te* 'side, country', Mordv. (Erzja) *iřd'es* 'rib', Cheremis *ōrδəž* 'side', Komi *ord-* 'side', *ord-lj* 'rib', Votyak *urd* 'rib' (Lytkin and Guljaev 1970:206). An Iranian borrowing (see Jacobsohn 1922:206, Joki

47. The meaning 'plow shaft' is represented in Balto-Finnic by Finn. *oja*, Veps *ojad*, an obviously recent loan, possibly from Slavic: cf. Pol., Cz. *oje* 'shaft of plow' (Joki 1973:293-94).

1973:255) with the front vowel a specifically Iranian development, cf. Oss. *ærdæg* 'half, side', Sogd. *ʾrδ* (**ard-*), Avest. *arəδa-* (cf. Skt. *ardhá-ḥ* 'half, side').

Fi-U **asʷrʷ*: Mordv. (Erzja) *azoro*, *azor*, (Moksha) *azār* 'lord', Votyak *uzj̄r* 'wealthy', Vogul *āt̄ar*, *ōt̄ar* 'prince'. According to Joki (1973:253), the Finno-Ugric form may go back to an early Iranian loan (as shown by the fluctuation in the rendition of the spirant): Avest. *ahura-* 'lord, prince', *Ahura- Mazdā-* (lit. 'wise lord'), OPers. *Auramazdā-* (name of a god).

Fi-U **mekše*: Finn. *mehi-läinen* 'bee', Est. *mehi-läne* 'bee', Mordv. (Erzja) *mékš*, *mākš*, (Moksha) *mēš*, Cheremis *mükš*, Komi-Zyr. *moš* 'bee', Hung. *méh* 'bee' (Lytkin and Guljaev 1970:169, Joki 1973:281-82). Borrowed from early Iranian prior to the change of **kš* to **xš*, cf. Avest. *maxš-* 'fly', Buddh. Sogd. *mwyšk-*, Khotanese Saka *māva-*, Kurd. *mêš* 'fly, bee' (cf. Skt. *mákṣa-* 'fly'). The Finno-Ugric *e* vocalism may reflect the influence of the semantically associated **mete*/**meke* 'honey'. Since this Indo-Iranian form has no obvious correspondences elsewhere in Indo-European (see Hamp 1971 for criticism of Wagner's comparison to Mod. Irish *b'ax*, *m'ax*, *b'ax'ig*), no hypothesis of a pre-Aryan source for the Finno-Ugric form can be satisfactory. It should be noted that reliable Indo-Iranian borrowings in Finno-Ugric go back only to early Iranian. In accounting for the vocalism of Fi-U **mekše* the possibility of an early appearance of a front vowel on Iranian soil (cf. Kurd. *mêš* 'fly, bee') should be considered.

Fi-U **ora*: Finn. *ora* 'sharp metal object; drill', Veps *ora* 'drill', Vote *gra* 'point', Est. *ora*, Liv. (v)*orà* 'iron point', Mordv. (Erzja) *uro*, Hung. *ár*. A borrowing of an early Iranian word posited on the evidence of Skt. *āṛā* 'awl', OHG *āla*, cf. Lith. *yla* 'awl'. The initial vocalism in Finno-Ugric reflects the positional shift of *a* to *ā* before the sonants *r* and *n*. Such a development can be proposed for several allophones of **a* in early Iranian, and is reflected in Finno-Ugric borrowings which show *o* before *r* (cf. the frequent reflex of *ā* as *ā* in individual Iranian languages). A distributional analysis of the sounds denoted by various vocalic marks in the Avesta, and analysis of phonetic and phonological correlations between the various vowel segments of Avestan, would be of interest in this connection. Also interesting for this question is the later reflection of Baltic *a* as *o* in Finno-Ugric languages: Finn. *lohi* 'salmon': Lith. *lāšis* (see Joki 1973:238-39).

Finno-Volg. **oraś* (**voraś*): Finn. *oras* 'castrated boar; boar', *orasa* 'male dog', Veps *orač* 'male, boar, male dog', Mordv. (Moksha) *urās*, *urozi* 'castrated boar' (Joki 1973:296). A loan from early Iranian with a palatal spirant, cf. Avest. *varāza-* 'boar', Pers. *varāz* 'boar', mod. Pers. *gurāz* 'boar' (cf. Skt. *varāha-* 'boar, pig'). The Finno-Ugric initial **o* is secondary, as shown by the fact that this word is exclusively Indo-Iranian, without etymological connections elsewhere in Indo-European. It is hard to assume on the sole evidence of a handful of Finno-Ugric loans that they reflect a stage in the evolution of Proto-

Indo-Iranian when Indo-Iranian consonantism was already present with all its family-specific changes while the vowel system was still that of Proto-Indo-European, before the merger of **e*, **a*, and **o* to **a* (as has in fact been claimed by some investigators of Finno-Ugric: see Rivila 1959). It is even harder to claim that this 'original' pre-merger Proto-Indo-Iranian vowel system is to be seen in forms where the **o* is found in strictly limited combinatorial positions — before **r*. Since forms from Proto-Indo-Iranian are thus ruled out, the Finno-Ugric borrowings can be attributed to a later stage, specifically to early Iranian (or Proto-Iranian), for which palatal fricative reflexes of Indo-European palatovelars are characteristic.

Finno-Volg. **orja*: Finn. *orja* 'slave', Veps *orj* 'slave', Est. *ori* 'slave', Lapp *årjel* 'southern', *årjān* 'far to the south or southwest', *oarje-* 'southwestern', *oarji* 'southwest', *orjalaš* 'mountain Lapp', *vuorjäl* 'northwest', *vyørje* 'north' (Proto-Lapp **orja* 'south'), Mordv. (Erzja) *urē* 'slave, hired worker' (Joki 1973:297). From early Iranian with initial **a* before *r* reflected as **o*, cf. Avest. *airyō*, *airya-* 'Aryan', OPers. *ariya-* 'Aryan', cf. Parth. *'ry*, Pehl. *ērān* 'land of the Aryans', mod. Pers. *ērmān* 'guest', Oss. *æcægælon* 'foreign, someone else's', *allon* (ethnic term: Abaev 1958:I.101); cf. Skt. *arīḥ* 'foreign, someone else's', *aryāḥ* 'master, host', *āryaḥ* 'Aryan'. The semantics of the Finno-Ugric word is interesting. In terms of the direction of borrowing, the meaning 'south' (in Proto-Lapp **orja*) reflects the relative spatial positions of the two groups of contacting languages. The meaning 'slave' may point to the social position of early Iranian speakers among the Finno-Ugric speakers: the Iranians may have hired out as farm workers or herders, as is consistent with the significant number of Iranian agricultural and stockbreeding terms in Finno-Ugric.

Fi-U **onća* 'part': Finn. *osa* 'part, portion', Veps *oza* 'luck, portion', Vote *ęsa* 'part', Est. *osa* 'part', dial. 'meat'; Liv. *voza* 'part', Lapp *oaž'že* 'meat', Cheremis *uža-š* 'part' (Joki 1973:298; cf. Illič-Svityč 1971:I.253). A loan from early Iranian with a palatal affricate from Indo-European palatal **kʰ* and a reflex of initial **a* as **o* before the sonant *n*, cf. Avest. *qsa-* 'group of followers' (Skt. *āmsaḥ* 'part, portion', Gk. *ógkos* 'load', PIE **onkʰo-*).

Finno-Perm. **šorv(a)*, Ugric **šarv(a)-*: Finn. *sarvi* 'horn', Veps *sarv* 'horn', Liv. *sōra* 'horn', Lapp *čoar've* 'horn', Mordv. (Erzja) *šuro*, (Moksha) *šurā* 'horn', Cheremis *šur*, Votyak *šur*, Komi-Zyr. *šur* 'horn'; cf. Vogul *šōrap* 'fawn', Ostyak *t'ərpe* 'fawn', Hung. *szarv* 'horn'. Borrowed from early Iranian **šraw-/*šarw-*, with Iranian **a* before **r* (*ār*?) reflected as Finno-Perm. **o* (cf. Fi-U **ora*, **orja*, **pors* and others, above).⁴⁸ Cognates represented in the

48. The treatment of Iranian **ar* (*ār*) as Finno-Ugric **or* does not occur in Fi-U **arva*: Finn. *arvo* 'price, weight, meaning, worth', Vote *arvo* 'understanding, clarity', Est. *aru* 'understanding, clarity; quantity', *arv* 'number, quantity', Liv. *āra* 'thought, idea; account; direction', Hung. *ár*, *árr* 'price'. The word is of Indo-Iranian origin in view of its **r* from PIE **t*: cf. Skt. *arghá-* 'worth; price', *ārhati* 'deserves, is worth', Avest. *arāja-* 'valuable', *arajah-* 'price', *arajaiti* 'costs, is worth, worthy', Sogd. *'ry* (= **ary*) 'price', Yagnobi *arz-* 'costs, is worth'

historical Iranian languages are Avest. *srvā-*, *srū-* 'horn', *srvara-* 'horned', Pehl. *srū* 'horn', Khotanese Saka *ṣṣū-* 'horn', mod. Pers. *surūn*, *soru*, *serū(n)*, Parachi *ṣṭi*, Wakhi *ṣəw*, Sanglechi *ṣōu*, Yidga *ṣū*, Baluchi *srō*. Skt. *śṛṅgam* 'horn' belongs to a different derivational type (see Joki 1973:311).

Fi-U **marta-s*: Finn. *marras* (stem *marta-*) 'decrepit, sterile, dead', Est. *mardus* 'vision portending death'; Votyak *muri* 'barren (cow)', Komi-Zyr. *murka* 'barren' (see Lytkin and Guljaev 1970:178, 175, Joki 1973:280-81). Borrowed from an Iranian form reflecting the zero-grade **mr̥ta-*, in view of the Balto-Finnic and Permian reflex **ar* (while early Iranian **ar* is reflected in Finno-Ugric as **or*), cf. Avest. *marəta-* 'dead, mortal'. A second, later borrowing as **mertā* is assumed (Erzja Mordv. *mīrd'e* 'person, husband', Votyak *murt* 'person, husband', Komi-Zyr. *mort* 'person'), with a secondary Iranian front vocalism as in Khotanese Saka *mārāre* 'they die', Oss. *mærdæ* 'death'; for the semantics cf. Iranian forms with full grade: Avest. *marəta-* 'mortal', *maša-* 'person, mortal', Sogd. *mr̥t mr̥t* 'every person', Pehl., mod. Pers. *mard* 'person' (cf. Skt. *mārta-* 'person; mortal').⁴⁹

Fi-U **sata*: Finn. *sata* '100', Veps *sada* '100', Est. *sada*, Liv. *sadā* '100; number, quantity', Lapp *čuotte* '100', Mordv. (Erzja) *śado*, (Moksha) *śadā*, Cheremis *šūḍa*, Votyak *śu*, Komi-Zyr. *śo*, Vogul *sāt*, Ostyak *sot*, Hung. *száz*. Borrowed from early Iranian **sata-*, cf. Avest. *satəm*, OPers. *θata-*, Khotanese Saka *sata-*, *sa-*, Sogd. *st-*, Pehl. *sat*, mod. Pers. *sad*, Oss. *sædæ*. Skt. *śatām* '100' coincides with the reconstructed early Iranian form, but there is no reason to consider the Sanskrit form a source for the Finno-Ugric one in this isolated instance (see Joki 1973:311).

Proto-Mordv. **sasar*: Mordv. (Erzja) *sazor*, (Moksha) *sazâr* 'younger sister, female cousin, brother's or sister's daughter; bride'. Borrowed from early

(Andreev and Peščereva 1957:226), Pehl. *arz* 'price', Pers. *arz* 'price', Gk. *alphē* 'profit', *alpheîn* 'earn', Lith. *algà* 'payment': PIE **olgho-*/**lgho-*. It is possible that the form was borrowed with positional preservation of the labiovelar before the palatalized variant was generalized to the whole paradigm: **(a)rg^hoa-* > **argwa* > Proto-Finn. **arva* (with simplification of **rgw* to *rw*). The Sogdian form **ary* 'price' is interesting in this connection (Abaev 1958:I.65); it has generalized the non-palatalized reflex of the old labiovelar. For preservation of the velar in Iranian cf. also the Iranian source for Arm. *yargem* '(I) value', *yargun* 'valuable', *an-arg* 'unworthy, worthless' proposed by Pedersen (see Hübschmann 1897:477).

The word is a migratory term widespread throughout the Near East, cf. Hitt. *arkamman-* 'tribute', Luw. *arkammana-* 'tribute', Ugar. *argmn* 'tribute; purple', Akkad. *argamannu* 'purple, tribute' (Friedrich 1952:30). This is the explanation for the deviation from regular reflexes in the Finno-Ugric Italicism (*a* instead of *o* before *r*; *-rv-* instead of *-rg-*). The word need not have come into Balto-Finnic directly from Indo-Iranian. Therefore it cannot be regarded as an example of a Proto-Indo-Iranian or Sanskrit word in Finno-Ugric.

49. Thus these Finno-Ugric Italicisms reflect two ablaut grades in two semantically distinct derivatives. Early Iranian syllabic **r̥* is reflected as Finno-Ugric **ar*: Finno-Perm. **marta-* 'dead; sterile' < Iran. **mr̥ta-* 'dead'; early Iranian **ar* is reflected as **or* (cf. **porsa-*, **ora*, **orja*, etc.); while at a later period forms with front vocalism arise from **ar* within Iranian and are reflected in loans: Perm. **mertā* 'mortal, person' beside Avest. *marəta-*, *maša-* 'person, mortal', mod. Pers. *mard* 'person', Oss. *mærdæ* 'death'.

Iranian **soasar*- 'sister' (before the Iranian shift of **s* to *x* and **so* to *xo*), cf. Avest. *xvaṇhar*- 'sister', Pehl. *xwahar*, mod. Pers. *xvāhar*, Pashto *xōr*, Oss. *xo* 'sister'. The Finno-Ugric form reflects the still-unitary labialized phoneme of this chronological level (late Iranian **xo*, PIE **śo*) as a plain *s*; cf. Skt. *svásar*- 'sister', Lat. *soror*, OCS *sestr-a*, etc. (Joki 1973:312).

Ugric **sāptā*: Vogul *sāt* 'seven; week', Ostyak *tāpət*, *lāyət*, *lāyət*. Borrowed from early Iranian, reconstructed as **sapta*/**sāptā* 'seven': Avest. *hapta*, Sogd. *βit*('), Alan *abda*, Oss. *avd* 'seven', *ævdæm* 'seventh', Pehl., mod. Pers. *haft* 'seven', Parachi *hōt* (cf. Dardic *sat*, *sāt*, Kafirian Prasun *sete*, Skt. *saptā*). A front allophone **ā* of the phoneme **a* is assumed for early Iranian in certain positions (cf. the allophone *ā* before sonants). The secondary nature of this variant can be seen from the second syllable, where all Indo-European dialects point to a syllabic **m̥*, reflected as *a* in Indo-Iranian (Avest. *hapta*, Skt. *saptā*) and Greek (*heptā*) beside *-em* in Lat. *septem* 'seven'. Therefore the suggestion that Ugric here reflects a Proto-Indo-European form cannot be considered acceptable (see Joki 1973:313).

Finno-Volg.-Perm. **śuka*: Finn. *suka* 'comb', Veps *suga*, Est. *suga*, Lapp *čokkot* 'comb' (verb), Mordv. (Erzja) *śuva* 'chaff', (Moksha) *śuva* 'awn, beard (of grain)', Cheremis *śu* 'bran, chaff', Komi-Zyr. *śu* 'rye, grain, bread'. A borrowing of an early Iranian form with a palatal spirant: cf. Avest. *sūkā*- 'chaff of grain', mod. Pers. *sōk* 'chaff', Yagnobi *suk* 'chaff, awn of grain'; cf. Skt. *śukaḥ* 'chaff or awn (of grain), antennae (of insect)', which formally coincides with early Iranian (see also Joki 1973:315-16).

Proto-Perm. **śumjs*: Votyak *śumjs* 'raw leather', Komi-Zyr. *śumjs* 'strip of raw leather'. Borrowed from early Iranian: Oss. *xujun*, *xoín* 'sew', cf. the *-*m(en)* stem of Skt. *syūman*- 'belt, strap, connection, chain, bonds' (see Lytkin and Guljaev 1970:274, Joki 1973:318).

Finno-Perm. **tarna*: Finn. *tarna* 'sedge, grass, hay', Est. *tarn* 'sedge', Votyak *turjn* 'grass', Komi-Zyr. *turun* 'grass' (see Lytkin and Guljaev 1970:287, Joki 1973:325). A borrowing from early Iranian can be assumed, cf. Khotanese Saka *tarra*- 'grass', Pehl. *tarrag* (*tik*) 'plant', mod. Pers. *tara*, *tarra* 'small twig'. The proposed Iranian form **tṛna*- coincides with Skt. *tṛṇa*- 'grass'. Vocalization of the syllabic sonant as **ar* or **er* is reflected in the Finno-Permian form as *ar* (and not **or*, which would reflect the sequence *a + r* of early Iranian).

Volg.-Perm. **seṭ*/**sejt*: Mordv. (Erzja) *sed* 'bridge', (Moksha) *śed* 'bridge, floor', Komi-Zyr. *sod* 'bridge, step, stairs' (Lytkin and Guljaev 1970:259). An early Iranian loan (cf. Avest. *haētu*- 'dam', Khotanese Saka *hī* 'bridge', Pashto **hēl* 'dam', Parachi *hī* 'bridge', Oss. *xid*, *xed*, Sarikoli *yeid*, Shugni *yēd*, *yēid* 'bridge') with change of the diphthong *ai* via *ei* to *e* (cf. the typologically similar later development of Skt. *śetuḥ* 'joining, linking; bandage, dam, bridge', Dardic *ser*, Kafir *sēw* 'bridge'); see also Joki 1973:313-14.

Ugric **śeṅk*(?): Vogul *sāṅkōá* 'stake', *seṅk*, *saṅkō*, *sūṅ*, Hung. *szeg*, *szög*

'nail, stake'. Possibly borrowed from early Iranian. Historical Iranian forms are attested sporadically: Pashto *sāṅga* 'branch', Sanglechi *zaṅgīāk* 'wooden pegs', Sogd. *šnx*; cf. Skt. *śaṅkūḥ* 'wooden nail, peg' (PIE **k̑hankh-*). The vocalism of the reconstructed Ugric form is not clear: see Joki 1973:312.

Fi-U **kara-*: Mordv. (Moksha) *karams* 'dig, dig through, pick', (Erzja) *karams* 'pick off, tear off', Cheremis *korem* 'make furrows', Votyak *kyryny* 'break through, wash away (dam)', Komi-Zyr. *kirni* 'break, burst, be washed away, collapse'. The word is considered a borrowing from Iranian, cf. Avest. *kar-* 'make furrows', Pehl. *kār-* 'work land, plow, sow', Pashto *karal* 'sow' (Joki 1973:266). In that case the *a* before *r* in the Finno-Ugric protoform would presuppose a syllabic **r* in the Iranian source. The Sanskrit cognate *kar-* 'sprinkle, throw, scatter' does not express meanings connected with agriculture, which is further evidence that the Finno-Ugric word is of Iranian origin. On the other hand, not all the Finno-Ugric cognates correspond to the proposed Iranian meaning, which may cast doubt on the possibility of an Indo-European source for the Finno-Ugric protoform (see Lytkin and Guljaev 1970:153).

Fi-U **kan3*: Komi-Zyr. *kundj-* 'dig under, bury', Vogul *χūn-* 'scoop out with spoon', Hung. *hány* 'throw, hurl, rake out'. Borrowing from Iranian **kan-* 'dig, throw' is proposed, cf. OPers. *kan-* 'dig', Avest. *kan-*, Pehl. *kandan*, *kan-* 'dig', mod. Pers. *kandan* 'dig', Dardic *khan-* 'dig', Kashmiri *khanun* 'dig' (see Joki 1973:275). However, a vocalism before *n* in the Finno-Ugric form is not regular. For Komi-Zyr. *kundj-*, it should be noted, other correspondences have been proposed: Mordv. (Moksha) *kalmams* 'dig under', with a different protoform **kylm3* unconnected with Indo-European (Lytkin and Guljaev 1970:146).

Fi-U (Proto-Uralic) **aše-*: Finn. *ase-*, *asu-*: *asetta-* 'put, place, stand', *asema* 'place, location'; *asu-* 'live, be, be located', Mordv. (Moksha) *ežám* 'place', (Erzja) *ežem* 'place', cf. Yurak *ṇesō-* 'stop overnight and pitch tent'. The form can be compared to PIE **es-* 'be' (Skt. *as-*, Avest. *ah-*, Hitt. *eš-/aš-*, etc.) and **es-* 'sit' (Skt. *ās-*, Avest. *ās-/āh-*, Hitt. *eš-*, Gk. *hēstai* 'sits'): Joki 1973:252-53. An ultimate genetic unity has also been proposed for these forms (Illič-Svityč 1971:I.268-70). The vocalism and the nature of the spirant in the Uralic form may be evidence in favor of borrowing from an early Iranian source with phonetic variation *s* ~ *š* ~ *h*.

Fi-U **jüvä* < **jeva* 'barley, grain': Finn. *jyvä* 'grain, seed', Est. *iva*, *jüvä*, Mordv. (Moksha) *juv* 'chaff', (Erzja) *juvodom*s 'sift, winnow', Votyak *ju* 'crops, grain', Komi-Zyr. *jiki* 'chaff' (cf. *kj* 'beard, awn of grain'): Lytkin and Guljaev 1970:111. Borrowed from an Iranian source with a secondary front vowel in the first syllable, such as Oss. *jæw* 'millet' (cf. Avest. *yava-* 'grain', Skt. *yávaḥ* 'grain, barley, millet', Lith. *jāvas* 'grain', PIE **yewo-*): Joki 1973:265.

Finno-Volg. **vašara*: Finn. *vasara* 'hammer', Est. *vasar*, Liv. *vazar*, Lapp *væččer* 'hammer', Mordv. (Erzja) *užer(e)*, (Moksha) *užər* 'club'. A borrowing

from early Iranian with a palatal fricative, cf. Avest. *vazra-* 'Mithra's club', Khotanese Saka *vaśāra* 'lightning, club, diamond', Pehl. *wazr*, *warz* 'club' (cf. Skt. *vájrah* 'Indra's club'): see Joki 1973:339.

Komi-Zyr. *vurun* '(sheep's) wool' < **vorn*3? Borrowed from an early Iranian form with *o* as a reflex of *a* before *r*, cf. Avest. *varənā-* 'wool' beside Bartang *wōwn* 'wool', Khuf *wōwn*, Shugni *wōn* (Sokolova 1967:60), cf. Skt. *ūrṇā* 'wool' (Joki 1973:348-49).

Komi-Zyr. *gu-* 'steal', *guś* 'thief'. Borrowed from Proto-Iranian (cf. Avest. *gaḍa-*, Sogd. **yaḍa-* 'steal', Pashto *yal* 'thief', Wakhi *ḡūd* 'thief'), judging from the reflex of Iranian **a* as *u* (see Joki 1973:262).

Komi-Zyr. *burjś*, *burśi* 'mane (of horse)'. Borrowed from Iranian, cf. Avest. *barāša-* 'horse's back', Pehl. and mod. Pers. *buś* 'neck, (horse's) mane', cf. Oss. *barc* 'mane' (Abaev 1958:I.237, Lytkin and Guljaev 1970:42). The *u* vocalism in Komi-Zyrian indicates a very early loan of a form with Iranian *a* (Joki 1973:256).

12.5.5. East Iranian migrations and early Iranian loans in Finno-Ugric

In addition to the earliest Iranian loans in Finno-Ugric, lexical borrowings can also be found from a later Iranian source, coinciding with historical Iranian forms and obviously reflecting a later migration of the East Iranians.

Votyak *ana* 'without': cf. Iran. *ana-* 'without' in Avest. *ana-zqθa-* 'sterile, barren', Oss. *ænzæ-zad* 'sterile, barren' (cf. Arm. *an-* in *an-anun* 'nameless', Celt. *an-*, OHG *āno* 'without'): see Abaev 1958:I.149-50, Joki 1973:249.

Votyak *andan* 'steel', Komi *jendon*: cf. Oss. *ændon* 'steel' (Joki 1973:249-50, Abaev 1958:I.156-57, M. Schwartz 1974:409).

Ob-Ugric **är̥y*3: Ostyak *är̥y* 'song; ancient heroic song', Vogul *ēr̥iy* 'song'. From Middle Iranian **ār̥ya-/arya-*, cf. Oss. *arğaw* 'tale', Sogd. **ni-yr̥āy-* 'sing, celebrate in song' (cf. Skt. *arkāḥ* 'song, ray, radiance', Arm. *erg* 'song', Hitt. *arkuwai-* 'pray'): Joki 1973:254.

Proto-Perm. **bazd'yn*: Votyak *ba(d')d'žin* 'large, numerous'. Borrowed from Iranian, cf. Oss. *bæz-* 'fat, thick, dense', *bæzğyn* 'fat, thick, dense', Avest. *bazah-* 'size' (cf. Skt. *bahúḥ* 'thick, dense, numerous', Gk. *pakhús* 'thick'): see Joki 1973:255, Abaev 1958:I.257.

Proto-Perm. **berid'z*: Votyak *beriz* 'linden', Komi-Perm. *beris* (Lytkin and Guljaev 1970:39). Borrowed from Iranian (Joki 1973:255), cf. Oss. *bærzæ* 'birch', Shugni *bəruj*, *bərüž*, Sanglechi *bəraž* (cf. Skt. *bhūrjā-* 'birch'): Abaev 1958:I.253-54.

Proto-Perm. **das* 'ten': Votyak *das* 'ten', Komi-Zyr. *das* 'ten'. Borrowed from Iranian, cf. Oss. *dæs* 'ten', Sogd. **ḍas* (*ḍs*), Avest. *dasa* (cf. Skt. *dāśa*): Lytkin and Guljaev 1970:86, Abaev 1958:I.359. Possibly from a similar Iranian

source is Hung. *tíz* (Joki 1973:257, 329; pace Joki, the source for the Hungarian word must be an *East Iranian* dialect).

Votyak *erdzi* 'eagle'. Borrowed from a Middle Iranian form with initial **ā-*, cf. Avest. *ərəzi-fya-* 'eagle' (cf. Grantovskij 1970:291), OPers. *ārksiphos* 'eagle' (Hesychius) (cf. Skt. *rjipyāḥ*, Arm. *arciw*): see Joki 1973:259.

Mordv. (Erzja) *eṛva* 'each'. Borrowed from Iranian **harva-*: Avest. *haurva-* 'all, each', OPers. *haruva-* 'whole, all' (cf. Skt. *śārva-*): see Joki 1973:259.

Ob-Ugr. **ěrt* 'clear, bright': Ostyak *etər* 'clear, light', Vogul *etər* 'clear'. Borrowed from Middle Iranian, cf. Oss. *ird* 'clear', Yidga *ləroyo* 'clear sky' < **idrakā-* (Joki 1973:260).

Finn. *vermen* 'top layer of skin', *verme* 'clothing, weapon', Lapp *vier'mē* 'net'. The Balto-Finnic and Lapp words are comparable to Middle Iranian words with front vocalism, cf. the Iranian source proposed for Arm. *vermak* 'bedspread' (beside *varm* 'net'), cf. Oss. *wormeg* 'upper garment, fur coat'. The word is weakly represented in Finnic; an early Iranian borrowing would have given Finno-Ugric *o* from **a* before *r*, cf. Avest. *vārəθman-* 'coat of mail' (Iran. *var-* 'cover', Skt. *vṛṇóti* 'covers, wraps'): see Joki 1973:343.

Mordv. (Erzja) *vérges*, (Moksha) *vərga-s* 'wolf'. From Middle Iranian, cf. Avest. *vahrka-* 'wolf', Sogd. *wyrk-*, Khotanese Saka *birgga-*, Oss. *wærx-æg* 'name of founding hero of Nart line', Yidga *wərg*, mod. Pers. *gurg*, Kurd. *varg* 'wolf'. The form is borrowed from one of the languages having voicing of the final **-k-* (see Joki 1973:342-43).

Ob-Ugric **wat3*: Vogul *wāt*, *wāt* 'wind', Ostyak *wōt*. Borrowed from Iranian: Avest. *vāta-* 'wind', Pehl. *w't*, Khotanese Saka *bāta-* (cf. Skt. *vātaḥ* 'wind'): see Joki 1973:340-41.50

Finno-Volg. **wasa*: Finn. *vasa* 'calf', Veps *vaza*, Est. *vasikas* 'calf', Liv. *va'iški*, *vask*, Lapp *vyesi* 'fawn', Mordv. (Erzja) *vaz*, (Moksha) *vaza*. Borrowed from Iranian, cf. Yagnobi *wása* 'calf', Oss. *wæx*, Yazgulami *wūs* (cf. Skt. *vatsáḥ* 'calf, child'): Joki 1973:338-39.

Finn. *varsa* 'colt', Veps *varz*, Est. *vars*, Liv. *vārza*. A probable borrowing from an Iranian form with a syllabic **r̥* such as Oss. *urs*, *vurs* 'mare', which would explain the vocalism with *a* before *r*; cf. Avest. *varšni-* 'ram', *varəšna-* 'masculine', Sogd. *wšn-*, Wakhi *wušəng* 'breeding bull' < **wṛšanaka-*, cf. Skt. *vṛṣā* 'man, male animal'. The Balto-Finnic form shows similarity to the Ossetic one in reflecting syllabic **r̥*, in its cluster **rs*, and in its meaning ('colt' as opposed to 'ram', 'bull', etc.). The etymologically related Mordvin forms with **ā* vocalism (Erzja *veriske*, Moksha *verskā* 'lamb') can be explained as relatively recent loans from Baltic (Lith. *veřšis* 'calf', Latv. *vērsis* 'bull'): see also Joki 1973:337 (with a different explanation of the Mordvin form).

50. The Ob-Ugric languages of western Siberia also have other obvious loans, primarily cultural terms from Middle and Old Iranian languages: see Korenchy 1972, Joki 1973:372, 1973a.

Pre-Perm. **vaŋka*: Finn. *vanko* 'iron hook', Est. *vang* 'handle, doorknob, crampon, hoop', Liv. *vaŋga*, Votyak *vug* 'handle, doorknob', Komi-Zyr. *vug* 'crampon, hoop' (Lytkin and Guljaev 1970:69). An Iranian loan, cf. Sogd. *ywnk* (< **vi-vanka-*), Oss. *wæŋg*, *wong*, *ong*, *jong* 'joint' (cf. Pali *vaṅka* 'curved; curve (noun)', Skt. *vaṅku-* 'crooked', *vāṅgati* 'limps'). The form is an exception to the regular rule, with **a* instead of the expected **o* before **n* (cf. regular **onka-*, **onsa-* above), which may point to a different time of borrowing; cf. the related Ugric forms, probably borrowed later with **ä* vocalism: Vogul *wəŋkær* 'hook', Ostyak *wəŋrep* 'hook' (Ob-Ugric **vāŋk(3)-r(3)p*, Joki 1973:336, 341). A similar reflex is found in isolated Middle Iranian loans in Ugric such as Ostyak *wārās*, *wārās* 'mane': Avest. *varāsa-* 'hair (human or animal)', Sogd. *wrs*, Pehl. *wars* [wls] 'hair', Khotanese Saka *bilsa-*, mod. Pers. *gurs* 'lock, curl' (Joki 1973:336); cf. also individual late borrowings into Permian languages: Komi-Zyr. *varnös* 'year-old ewe', cf. Pehl. *warrag* 'sheep', Yagnobi *barrá* 'lamb', Pashto *wrəy* (Skt. *úrāṇaḥ*).

Fi-U **verd3-*: Cheremis (*w*)*urdem* 'feed, bring up', Komi-Zyr. *verdnj* 'feed'. Borrowed from an (early) Middle Iranian form with front vocalism such as Oss. *awærdyn* 'spare, pity, save' (Abaev 1958:1.86-87), cf. Avest. *varəd-* 'raise, grow, increase, maintain', *varəzda-* 'large', *varəd-* 'increase, expansion' (Joki 1973:348). Front vocalism is unambiguously established for the Finno-Ugric form: see Lytkin and Guljaev 1970:52.

Finno-Perm. **viša-*: Finn. *viha* 'hatred, anger, poison', Est. *viha* 'anger, animosity', Komi-Zyr. *vež* 'anger, envy' (Lytkin and Guljaev 1970:49). Borrowed from Iranian after the shift of IE **s* to *š* after **i*: cf. Avest. *viša-* 'poison', Pehl. *wiš* 'poison' (cf. Kafir Waigali *wīš*, Kati *wīš*, Skt. *viśám* 'poison'): see Joki 1973:346-47.

Proto-Vogul **mant3*: Vogul *mant* 'small shovel, scoop'. Contra Lewy 1961:408, the form is to be considered a loan not from Sanskrit (cf. Skt. *mānthā-* 'pole for churning butter') but from Middle Iranian, cf. Shugni *māp*, Sarikoli *māθ*, Yidga *mōḫē* 'stick, pole', cf. Budd. Sogd. *mnδ-* (= *manp-*), Khotanese Saka *maṁth-* 'shake, stir', Oss. *æz-mæntyn* 'mix together' (Joki 1973:279-80).

Proto-Perm. **gort-* 'house, residence, living place': Votyak *gurt* 'village, settlement, house, native land', Komi-Zyr. *gort* 'house'. Borrowed from Iranian, cf. Avest. *gərəda-* 'den of devic beings' (from **house*, cf. Skt. *gṛhāḥ* 'dwelling, house'): see Joki 1973:262-63.

Cheremis *marij* 'man, husband, Cheremis'. Borrowed from Iranian, possibly Middle Iranian, cf. Avest. *mairya-* 'young man; member of men's league', Pehl. *mērag* 'husband, lover, young man' (cf. Skt. *māryaḥ* 'young man, lover'). The *a* of the Cheremis form permits the borrowing to be dated to the first millennium B.C.: see Joki 1973:280.

Proto-Mordv. **rava*: Erzja *rav*, *ravo* 'wave, sea, flood', Moksha *rava*

'stream'. Borrowed from Iranian, cf. Avest. *ravan-* 'stream', *raoḍah-* 'stream', OPers. *rautah-* 'river, stream' (cf. Skt. *srava-* 'current', *srávati* 'flows'): see Joki 1973:307.

12.5.6. Migratory terms in languages of ancient Central Asia

In addition to the Iranian loans surveyed above, a stratum of ancient loans in Finno-Ugric traceable to other Indo-European dialects can also be distinguished, as can a number of terms shared by many Indo-European and non-Indo-European languages and to be regarded as migratory words. The migratory words in Finno-Ugric include the following:

Finn. *olut* 'beer', Est. *õlu*, *õlut*, Liv. *vo'l* 'beer'. A widespread migratory term, cf. Oss. *ælut-on* 'beer' (Geo. *ludi*, dial. *aludi* 'beer'); OE *ealu*, Engl. *ale*, OSax. *alo-* 'beer' (Gmc. **alub*), Lith. *alus* 'beer', Latv. *alus* 'beer', OPruss. *alu* 'beverage', OCS *olŭ* 'beer, intoxicating beverage' (see Abaev 1958:I.129-31, Joki 1973:294-95).

Fi-U **kota*: Finn. *kota* 'dwelling, tent, hut', *koti* 'house', Vote *keta* 'room', Est. *koda* 'house', Liv. *kuodā* 'dwelling, house', Lapp *goatte* 'bear's den; Lapp tent', Mordv. (Erzja) *kudo* 'house, dwelling', Cheremis *kuḍā* 'Cheremis summer hut', Votyak *kya* 'summer hut', Komi-Zyr. *-ka* in *kerka* 'house'. A migratory term found in several Indo-European languages (Avest. *kata-* 'mud hut', Gk. *kotulē* 'cave', Goth. *hēþjō* 'room', ChSlav. *ko'tc* 'cell, nest', Hitt. *kutt-* 'wall') and a number of non-Indo-European languages of Eurasia: Mong. *qota[n]* 'settlement, house', Turkic *kota* 'house', Ket *qotā* 'place for overnight stay', Ainu *kot* 'place for house', *kotan* 'place', Geo. *k'ed-el-* 'wall', etc. (see Joki 1973:272-73, Illič-Svityč 1971:I.316-17).

Mordv. *tarvas* 'sickle'. Probably a migratory term also borrowed into Kafir languages (Prasun *tərw'az* 'sword', Kati *terwōč*) and Sanskrit (Skt. *taravāri-* 'sword'). Deriving Mordv. *tarvas* from a proposed Aryan **darghas*, PIE **dholgho-* 'sickle' (Joki 1973:325), is unacceptable for phonetic reasons.

Uralic **paŋka-*: Mordv. (Erzja) *paŋgo* 'mushroom', (Moksha) *paŋga*, Cheremis *poŋgā*, Vogul *pāŋχ*, Ostyak *paŋχ*, *poŋk* 'fly agaric', *paŋyā-*, *paŋkā-* 'hallucinate on fly agaric; prophesy'. A migratory word attested in various languages of Eurasia, cf. Gk. *spóggos* 'sponge', Arm. *sunk(n)*, Lat. *fungus* 'mushroom'; cf. Avest. *baŋha-* 'name of plant' (see Joki 1973:300-301, Wasson 1968, Elizarenkova and Toporov 1970, Ernout and Meillet 1967:262); cf. also Kartv. **sok'o-* 'mushroom': Geo. *sok'o*, Mingr.-Laz *sok'o*, Svan *sok'(w)*, and also Northeast Caucasian forms: Hunzib *zok'o*, Dido *zuku*, Batsbi *zok'* (see Klimov 1964:165).

Uralic **vaške/*vaske* 'copper, bronze': Finn. *vaski* 'copper, bronze', Est. *vask* 'copper', Liv. *vašk* 'copper', Lapp *veški* 'iron, copper'; Cheremis *waž*

'ore', Mordv. (Erzja) *ušk'ε* 'wire', Votyak *-veš* in *az-veš* 'silver', Komi-Zyr. *-jš* in *ez-jš* 'silver', Ostyak *wax* 'metal, iron', Hung. *vas* 'iron' (Lytkin and Guljaev 1970:69, 332). A migratory cultural term with phonetic variations in different languages; cf., in Indo-European, Toch. A *wās* 'gold', B *yasa* 'gold' < **wās*-, Arm. *oski* < *vask*-, Lith. *áuksas*, OPruss. *ausis* 'gold'. The word may be historically connected with Sumerian *guškin* 'gold' (see Joki 1973:339-40, Aalto 1959).

Uralic **kur3*:- Finn. *kuras* 'knife', Lapp *korr* 'small knife'. Comparable to forms of similar meaning in Indo-European (Lith. *kiŗvis* 'axe'; Goth. *hairus*, OIcel. *hǰorr* 'sword') and non-Indo-European languages of Eurasia (Korean *khal* 'knife, sword', Manchurian *χal-mari* 'magic knife of shaman'); a borrowing from some common source is assumed (see Joki 1973:275-76).

12.5.7. *The semantics of early Iranian loans in Finno-Ugric. The occupations of the early Iranian settlers*

The above analysis of Iranian loans in Finno-Ugric has shown beyond a doubt that there are no Proto-Indo-Iranian or identifiably Sanskrit words among them.⁵¹ Indo-European vocabulary that has been characterized in a number of works (see Lewy 1961) as Indo-Iranian or even Sanskrit⁵² proves to be spe-

51. Wagner's comparison of the Erzja Mordvin god name *nišk'e*, *nišk'i* 'sky god' and Skt. *niškāh* 'golden neck ornament' (the word is absent in Iranian and may be a loan in Sanskrit: Mayrhofer 1963:II.169) is not convincing because the Mordvin word is a compound of *iñe* 'large' and **šk'i* = *ineške-pas* 'great god of the sky' (Joki 1973:293).

52. Apart from the Finno-Ugric forms surveyed above, the words that have been seen as Sanskrit include a set mostly limited to Balto-Finnic and probably representing borrowings from Baltic:

Finno-Perm. **tala*-s: Finn. *tala* 'hut, temporary shelter', Liv. *talāzāD*. The connection to Permian words (Komi-Zyr. *ūļes* 'hunting land', *teļes* 'hut', and others) is problematical (Joki 1973:324). Therefore the Balto-Finnic word can better be explained as a loan of a Baltic word such as OPruss. *talus* 'floor', Lith. *pā-talas* 'bed'. Thus the supposed Proto-Aryan connection (see Joki 1973:324: Skt. *tala-m* 'soil, surface') has no justification.

Finn. *tiine* 'pregnant', Veps *tiñeh*, *tīñeh*, Est. *tiine* 'pregnant' (of female domestic animals), Liv. *tin* (< **tein*?) is more likely a borrowing from Baltic (Lith. *dienti* 'pregnant') than from Iranian or Indic (Avest. *daēnu*- 'female animal; pertaining to a woman', cf. Skt. *dhenā* 'female animal'), in view of the meaning and the restriction to Balto-Finnic. The connection of these words to Hung. *tehén* 'cow', for which a Middle Iranian source is proposed (Joki 1973:329), is problematic.

Balto-Finnic **taivas*: Finn. *taivas* 'sky', Veps *taivaz*, Est. *taevas*, Liv. *tōvaz* 'sky, thunderstorm'. The word can be formally derived from either Iranian or Sanskrit (cf. Skt. *devā*- 'deity', Avest. *daēva*- 'demon', OPers. *daiva*- 'demon', Pehl. *dēw* 'demon, devil', mod. Pers. *dēv*). However, the restriction of this word exclusively to Balto-Finnic points rather to a relatively late source in Baltic, cf. Lith. *diēvas* 'god', OPruss. *deywis*, *deiws* 'god' (see Joki 1973:323).

Finn. *udar* 'udder', Veps *udar*, Vote *uhar*, Est. *udar*, Liv. *udār*, Mordv. *odar*, Cheremis *wa-δar* 'udder'. Since the word is restricted to Balto-Finnic and Finno-Volgaic it can be assumed to be of Baltic origin, where it is reconstructed as **ūdar*-/ **ūder*- 'udder' (Thomsen 1890:233),

cifically an early Iranian lexical stratum in Finno-Ugric. In some cases it is difficult to formally distinguish early Iranian from Sanskrit: **śata*, **marta*, **śuka*, and others. But a survey of the entire set of loans leaves no doubt that as a group they belong to early Iranian, not Sanskrit.

We can distinguish early Iranian loans in Finno-Ugric pertaining to stock-breeding and agriculture: **marta-s* 'barren' (of cattle), **porśas* 'pig', **oraś* 'boar', **śorv(a)* 'horn', **śumīs* 'raw leather', **kur3g* 'chicken, hen', **jüvä* 'barley', **śuka* 'chaff of grain', **tarna* 'grass', **mekše* 'bee'; transport terminology: **aiša* 'shaft for harness', **set3/*sejt3* 'bridge'; terms for agricultural implements: **ora* 'drill', **šeṅk3* 'nail, stake'; social terms: **asr̥r̥* 'lord', **orja* 'slave', **sasar* 'sister; bride'; terms pertaining to trade and accounting: **śarsa* '1000', **śata* '100', **das* 'ten', **sāptā* 'seven; week', **onća* 'part'; terms connected with a southward orientation and indicating motion from north to south: **śarid'z* 'sea; warm lands', and others.

Semantic analysis of the early Iranian loans in Finno-Ugric allows us to judge the nature of the relations between the Finno-Ugric and Iranian speakers and the occupations of Iranians in the Finno-Ugric milieu.⁵³ The bulk of the early Iranian settlers were evidently engaged in herding, agriculture, and various crafts, and they hired out to the local Finno-Ugric population as servants performing various agricultural and technical tasks (cf. **orja* 'servant, slave').

The loans show that the Iranian-speaking tribes separated from Proto-Indo-Iranian fairly early, evidently by the end of the third millennium B.C.,⁵⁴ and that some of them moved northwest along a route taken several times by subsequent Iranian tribes who were to leave their trace in the Middle and Late Iranian loans in Finno-Ugric discussed above. These early movements of

cf. Lith. *ūdrōti* 'get pregnant', *ūdrotas* 'pregnant', *paūdrė* 'stomach of pig' (see Joki 1973:332-33). The word is lacking in Iranian (due to taboo) but present in Sanskrit: *ūḍhar* 'udder', cf. Gk. *oūthar*, Lat. *ūber*, MHG *üter* 'udder'. But it cannot be ruled out that the source of the Finno-Volgaic word may have been an early Iranian **ūdar*, subsequently lost in Iranian due to taboo.

Also restricted to Balto-Finnic is Finn. *terni* 'colostrum', Est. *ternes* 'colostrum', Liv. *teř-zēmd'a*, comparable to Avest. *tauruna-* 'little, child', Oss. *tærna* 'child', Skt. *tṛ(u)ṇa-* 'young; tender; baby animal'. For phonetic, semantic, and historical-geographical reasons Indic and Iranian are unacceptable as sources (see Joki 1973:328).

53. On the other hand, a few reverse borrowings from Finno-Ugric into Iranian dialects are revealing for the character of the contacts: Proto-Uralic **kala* 'fish', preserved in Finn. *kala* 'fish', Mordv. *kal*, Cheremis *kol* 'fish', may have been borrowed by Iranians in the form reflected in the Avestan name of a mythic fish *Kara-* which lived in the river *Raḡhā-* (Volga) (Yašt 14.29; cf. Joki 1973:266). The same word may have been borrowed from western Finno-Ugric languages (cf. Lapp *guole* 'fish') into Germanic (Oldcl. *hvalr* 'whale', OHG *hwelira* 'sheatfish') and Baltic (OPruss. *kalis* 'sheatfish'); see Illič-Svityč 1971:I.288, Toporov 1975:III.168-71.

54. The breakup of Finno-Ugric linguistic unity was no later than the middle of the second millennium B.C., and hence the Iranian words that entered Finno-Ugric must have done so before that time. This limits the separation of Iranian from the Indo-Iranian community and the separate existence of Iranian proper to a period no later than the end of the third millennium B.C.

Iranian-speaking tribes followed their migration from an original territory in Central Asia; from there they spread to the north and northwest as well as southward toward Afghanistan.

12.6. The separation of Tocharian from Proto-Indo-European and the migrations of Tocharian speakers

12.6.1. Tocharian migrations to the east and Indo-European loans in Chinese

Tocharian diverged from Proto-Indo-European fairly early, with its speakers remaining together with other dialect groupings in the original Indo-European territory. This is the time when the isoglosses linking Tocharian with dialect areas including Anatolian, Italic, and Celtic could have arisen (see the diagram of dialect division in Chapter 7 of Volume I, Figure 3). However, the separation of Italic and Celtic from the protolanguage had not yet taken place when Tocharian separated from Anatolian and the Tocharians moved eastward toward Central Asia. The Tocharian dialects were clearly the first eastward migratory wave, preceding even the Indo-Iranian migrations.

In historical times, Tocharian dialects can be detected in Chinese Turkestan in the first millennium B.C. (Pulleyblank 1966). They are the source of Indo-European words in Chinese (and some other East Asian languages) such as Chin. *mì*, OChin. **mǎt* 'honey' (cf. Toch. B *mit* < **mǎt* 'honey'), Chin. *quǎn*, OChin. *k'iwēn* 'dog' (cf. Toch. B *ku*, acc. *kwem* 'dog'), Chin. *niú*, OChin. **ngiǎu* 'bull', cf. also Chin. *gǔ* 'bull', OChin. **kuo* beside Toch. A *ko*, acc. *ki*, B *keu* 'cow',⁵⁵ Chin. *zhū* 'pig', cf. Toch. B *suwo* 'pig', *swāñana* 'pertaining to pig' (cf. Karlgren 1923, 1940). It may have been the same source that gave Chinese mythology its image of sacred horses pulling the chariot of the sun (Pulleyblank 1966:31-32) and the view of the Big Dipper as a carriage.

Not only linguistic and mythological data testify to contacts of ancient China with Indo-European-speaking tribes; so do archeological remains of chariots harnessed with horses recently found in the territory of Yin Dynasty China. In particular, a two-wheeled carriage of a western Asian type was found in Hsiao-min-t'un together with the skeletons of two horses that had been harnessed to it. Also from the Yin dynasty are sacrificial pits with skeletons of horses and other sacrificial animals (see Kučera 1977:132-42, 182-85).

55. Possibly connected to the same Indo-European word is the Tungusic word for 'cow' (> 'mare': Cincius 1975:I.145), e.g. Manchurian *geo* 'cow, mare, female animal' (see II.3.1.3.6 above), although it is impossible to unambiguously determine the source language based on phonetic criteria. The word could also have entered Tungusic from other Indo-European dialects whose speakers moved across Central Asia.

Significantly, the entry of this type of chariot into Yin China took place, according to archeologists, due to contacts with powerful Central Asian populations who had chariots of the early Near Eastern type. These tribes must have had a fairly high level of socioeconomic and political development, which enabled them to bring a new type of military organization from the Near East across all of Central Asia (see Kožin 1977:284-85).

The early linguistic connections between Indo-European and Chinese leave no doubt that the people behind this Central Asian culture were specifically Indo-European tribes, who penetrated to eastern Central Asia from Southwest Asia in their chariots. A fuller picture of the movement of these tribes awaits detailed archeological investigation of the vast and little-studied expanses of Central Asia, which formed an intermediate zone in the eastward migrations of the ancient Indo-Europeans.⁵⁶

12.6.2. Tocharian loans in Finno-Ugric

The Tocharian speakers were in the east even earlier, spending some time in Central Asia on their way to Chinese Turkestan, as is confirmed by a number of Tocharian loans in Finno-Ugric, including the following:

Fi-U **mete* 'honey': Finn. *mesi* 'nectar of flowers; honey', Veps *meži*, Vote *mesi*, Est. *mesi*, Liv. *me'ž*, *me'ž* 'honey', Lapp *mieta* 'honey', Mordv. (Erzja) *med* 'honey', Votyak *mu*, Komi-Zyr. *ma* 'honey', Hung. *méz* 'honey' (see Lytkin and Guljaev 1970:167). A borrowing from early Tocharian **met* (**mǝār*) can be assumed: Toch. B *mit* 'honey'. A borrowing of Proto-Indo-European (or pre-Aryan) **medhu-* (see Joki 1973:283) is hard to accept in view of the significant phonetic discrepancies of these forms (the reflex of **dh* as voiceless **t*, the absence of the final *-u* in the Finno-Ugric form).⁵⁷ Yet a borrowing from later Indo-Iranian (Skt. *mádhu* 'honey beverage', Avest. *maðu-*, Sogd. *mōw-* 'wine') is ruled out by differences in vocalism (Finno-Ugric

56. Physical-anthropological evidence has recently come to light indicating a significant European contribution to the population that entered the Chinese province of Hansu in Central Asia (Goxman and Rešetov 1981). Migration routes for the European population have been established in the Altai Mountains and the upper Ob region (where these people could have had linguistic contacts with Uralic speakers). Archeologists trace the source of this migration to the 'post-Mediterranean' population of Tajikistan (Dremov 1980). Recent finds of European skulls in Bronze-Age Mongolia (Mamonova 1980) and the Tuva area (Goxman 1980, Goxman and Rešetov 1981) show that the European and Asian populations were in physical proximity at that period. Physical anthropologists mention the need for reconsideration of earlier views on the physical type of the population of Central Asia and southern Siberia.

57. The *-u* is present in a Balto-Finnic form (Finn. *meiu* 'honey', Vote *mōiu* 'beer', Est. *mōdu* 'beverage') which is regarded as a recent borrowing from Baltic (**medu-*) or Germanic (**meðu-*): Joki 1973:284.

e, Indo-Iranian *a). An ancient Finno-Ugric variant of this word, *meke 'honey' (Cheremis *mü, müj* 'honey', Vogul *mag, ma'j* [maɣ-], Ostyak *māχ, māy, maɣ*), may have arisen due to contamination of *mete 'honey' with *mekše 'bee' (see Joki 1973:284).

Uralic *nim(e): Finn. *nimi* 'name', Lapp *nâmmâ*, Mordv. (Erzja) *l'äm*, (Moksha) *l'em*, Cheremis *lām, lüm*, Votyak *ñim*, Komi-Zyr. *ñim*, Vogul *nam, nām*, Ostyak *nem*, Hung. *név*, Yurak *ñim*. A loan from early Tocharian *n'em-, cf. Toch. A *ñom*, B *ñem* (Pedersen 1950). Borrowing of Proto-Indo-European *en(o)m̥n̥, *(o)nom̥n̥ 'name' (Pokorny 1959:321) or an early Iranian word (cf. Avest. *nāma*) is precluded by the phonetic dissimilarity of these forms.

Volgaic-Permian *o/uška: Cheremis *üşkə-ž, üškü-z* 'bull, ox', Votyak *oš* 'bull, young bull, ox', Komi-Zyr. *ęš* (*ęšk-*), *ęška*, Komi-Perm. *őška* 'bull, young bull'. Most likely a borrowing from Tocharian, cf. Toch. B *okso* 'bull' (see Joki 1973:334); however, in view of the form with initial *u-*, an early Iranian source is also possible, cf. Avest. *uxšan-* 'bull', Skt. *ukṣā́* 'bull' (see Lytkin and Guljaev 1970:213).

Finno-Perm. *sal3: Finn. *suola* 'salt', Veps *sola*, Est. *sool*, Liv. *suol*, Mordv. *sal* 'salt', Cheremis *šind'žal* < *čan-sal3, Votyak *šjal* 'salt', Komi *sol* (Joki 1973:316). Borrowed from early Tocharian: cf. Toch. A *sāle*, B *salɣiye* 'salt' (or otherwise from western Indo-European, cf. OLat. *sale* 'salt'; see below). The word is not typical of Indo-Iranian languages; it is preserved in relic form only in Skt. *sal-ilā-* 'sea' (see II.5.3.7 above).

There are also borrowings in the opposite direction, from Finno-Ugric into Tocharian:

Toch. A *kālk-* 'go', B *kalāk-* 'follow', cf. Finn. *kulkea* 'go, walk' (Van Windekens 1976:625, Joki 1973:191).

Toch. B *ālp-* '(be) reflect(ed)'; cf. Vogul *al'p-t* 'decorate' (Van Windekens 1976:622).

The fact that a whole stratum of loans from Tocharian can be distinguished in Finno-Ugric (*mete 'honey', *nim(e) 'name', *oška 'bull', *sal3 'salt'), as well as possible Uralic loans in Tocharian, is evidence for ancient contacts between these languages. Such contacts could have taken place no later than the beginning of the second millennium B.C., in the territory of the Finno-Ugric dialects, to the south of the Urals and the north of the Aral Sea (for the location of Finno-Ugric see A. Smirnov 1975). From here the Tocharians could have reached their historical territory in Chinese Turkestan. This claim for contacts between Tocharian and Finno-Ugric assumes that the Tocharian-speaking tribes moved along the route that was followed, probably later, by speakers of early Iranian dialects.

12.7. The separation of the Ancient European dialects from Proto-Indo-European and the migration of Indo-European tribes across Central Asia

12.7.1. Joint migrations of Tocharian and Ancient European tribes

The Iranian, and especially Scythian, migrations can serve as a good example of distant migrations of Indo-European tribes to the west via an eastern route. Precisely this route must be assumed for the earlier movements of the Ancient European dialects Celtic-Italic, Illyrian, Germanic, Baltic, and Slavic. All these languages show a number of lexical isoglosses in common with Tocharian (see the diagram of dialect divisions at level 5: Chapter 7 of Volume I, Figure 3 above), which would be very hard to explain without positing contacts among them, probably in the course of joint migrations of speakers of these dialects and speakers of Tocharian.⁵⁸

There are words demonstrating the affinity of Tocharian with some or all of the Ancient European languages but not with Indo-Iranian (see Benveniste 1936:234-37 [1959:100-101], Van Windekens 1976:614-17; see also I.7.5.9 above). Words linking Tocharian with all the Ancient European dialects include the following:

Toch. A *wāl*, B *walo* 'king': OIr. *fol-n-* 'rule', *flaith* 'rule, lordship', Lat. *ualēre* 'be strong', Goth. *waldan* 'direct, rule', OIcel. *valda*, OHG *waltan* (Ger. *walten*), Lith. *vėldu* '(I) rule', OPruss. *wāldnikans* 'kings' (acc. pl.), OCS *vladq* '(I) possess, am master' (see Porzig 1954:142, 200 [1964:211, 295]).

Toch. A, B *kroñše* 'bee': Lat. *crābrō*, OHG *hornūz*, Lith. *širšuō*, Slavic **sīršenī* 'hornet'.

Toch. A *wās*, B *yasa*, *ysā-* 'gold': Lat. *aurum*, Lith. *auksas*, OPruss. *ausis* (see II.6.5.11 for this word as a migratory term of Southwest Asian provenience).

12.7.2. Lexical connections between Ancient European dialects and Central Asian languages as evidence for migration of Indo-European tribes to eastern Europe via Central Asia

The Tocharian speakers subsequently left Central Asia to move further eastward toward Chinese Turkestan, where they were located when their languages were first written down. The remaining Ancient European dialects moved westward across Central Asia and the Volga region to historical Europe. An easterly

58. Probably dating to this time are Indo-European loans in Altaic languages such as Tungusic *hukur* 'bull, livestock', OTurk. *öküz* 'bull, ox', Uzbek *hokyz* 'cattle', Mong. *ūxer* 'cattle'; these evidently go back to the time of Altaic linguistic unity (the source is the Indo-European *centum* form **peḱh₂u-*: Lat. *pecus* 'livestock', Goth. *faīhu* 'property').

migratory route explains certain lexical links between the western Indo-European languages and Altaic languages, from which they borrowed words such as **morkh-* 'horse': cf. OIr. *marc*, Welsh *march*, Gaul. *márkan*, OHG *mar(i)ha* (Ger. *Mähre*), OE *mearh* (Engl. *mare*) beside Mong. *morin*, Tungusic *murin*, Korean *mal* (cf. also Chin. *mǎ* < **mra*, OBurm. *mraŋ*, OTib. *rmang*, Tamil *mā*): see II.3.1.1.11 above, and Novikova 1979:67ff.⁵⁹

On the other hand, there are also loans from the Ancient European dialects into languages of Central Asia such as the Yeniseian group, which judging from old toponymy occupied a significant part of Central Asia before the end of the first millennium B.C., so that any tribes moving into Central Asia would have had to come into contact with them. The Proto-Yeniseian word for 'mare, gelding', **kus-*, must have entered these languages from an Ancient European dialects of the *centum* type, cf. Lat. *equus* 'horse', Gaul. *epo-* 'horse', Goth. *aiha-* 'horse' beside Toch. A *yuk*, B *yakwe* 'horse' (see II.3.1.1.19n22).⁶⁰ And in some Ancient European dialects, in particular Germanic, borrowings from Yeniseian must be assumed in such words as **hus* 'house': OHG *hūs* (Ger. *Haus*), OE *hūs* (Engl. *house*), cf. Yeniseian *qus* 'tent, house' (Dul'zon 1971:174; cf. II.7.2.1n5).

Interestingly, under Indo-European cultural influence the practice of horse sacrifice in connection with a sky-god cult arose among the Altaic peoples of antiquity (Koppers 1929, 1935, Kuz'mina 1974:44; see also II.3.1.1.19 above).

Among the possible Altaic borrowings from an Ancient European dialect of the *satem* type is OTurk. *keči* 'goat' (cf. OCS *koza* 'goat'), OTurk. *ečkü* 'goat', Mong. *išig* 'kid' (cf. Lith. *ožkà* 'goat'): see II.3.1.5.5 above.

Another probable Ancient European loan in Turkic which is illustrative of early contacts in Central Asia is OTurk. *ōküz* 'river' (*Drevnetjurkskij Slovar'* 1969:383), which has no Turkic etymology. The word may reflect the *centum* form **e/okho-* 'water; stream' reflected in Ancient European languages in such forms as Lat. *aqua* 'water', OIcel. *æger* 'sea god', OE *ēg-* (*ē*, *ēa*) 'stream; (sea) current', Goth. *aiha* 'river, stream'.⁶¹

59. A typological parallel for such a borrowing, with loss of an earlier word having the same meaning, comes from the Romance languages, in which Lat. *equus* 'horse', from PIE **ekho-* with the same meaning, is replaced by *caballus* (Haudry 1981).

60. It is interesting that the ancient Indo-European word for 'horse' enters the various Caucasian languages in a *satem* form, while it is borrowed into Central Asian languages in a *centum* form. This fully refutes the traditional view of the *centum* and *satem* dialects as western and eastern respectively.

61. Other probable reflexes of this Ancient European word in Central Asian languages can be seen in the names of the major rivers of Central Asia as recorded by classical authors: the Amu Darya is Gk. *Óksos*, Lat. *Ochsus*, and the Syr Darya is Gk. *Iaksártēs*. *Oks-* and *Iaks-* in these names can be interpreted as the same Ancient European word for 'river, stream', **ekho-* or **okho-* (cf. the analogous phonetic development of the same root in Toch. A *yok-* 'drink'). The later Iranian *Vaxš-*, name of a tributary of the Syr Darya, may go back to the same word.

In the light of this comparison, the second element of Caucasian and Caspian river names,

Another probable borrowing from Ancient European languages into Turkic is the Turkic word for 'aspen, poplar': Altai *aspaq*, *apsaq*, Chuvash *āvās*, Khakas *os* 'aspen' (see Sevortjan 1974:607-8) beside OIcel. *qsp* 'aspen', OE *æspe* (Engl. *aspen*), OHG *aspa* (Ger. *Espe*), OPruss. *abse* 'aspen', Latv. *apse* 'aspen', ORuss. *osina* (see II.4.1.6.2 above). Another is the borrowing of Ancient European **amlu-* 'apple' into Proto-Turkic as **alma* (see II.4.1.12.3n44).

It is possible that this same group of Indo-European dialects gave Old Chinese its word **lac-* 'milk' (cf. Lat. *lac*, gen. *lactis*: see II.3.1.3.3 above), for which no source can be found in Tocharian.

Further evidence for migration of Ancient European dialect speakers westward through Central Asia are Finno-Ugric borrowings from Indo-European whose source must be a dialect specifically of the Ancient European structural type.⁶² The following Finno-Ugric words (insofar as they cannot be interpreted as manifestations of an earlier genetic relationship of Indo-European and Uralic: see Collinder 1974, Illič-Svityč 1971:I, 1976:II) are among such borrowings.

Fi-U **orpa-s ~ *orva(-s)*: Finn. *orpo* 'orphan', Lapp *oarbes* 'orphaned', Mordv. (Erzja) *uros* 'orphan', Ostyak *-urɣi, -uri: ɣəŋk-u* 'orphan', Hung. *árva* 'orphan' (see Joki 1973:297-98, Collinder 1974:365). The word is an early Proto-Finno-Ugric borrowing from Indo-European (cf. Lat. *orbus* 'orphan', etc., see II.7.3.3 above), reflecting the original vocalism and rendering the voiced (aspirate) stop with alternating *p* and *v*. An Iranian source would present problems because this form is absent in Iranian (cf. Skt. *ārbhaḥ* 'child' with a different meaning).

Fi-U **aja-*: Finn. *aja-* 'drive, chase, carry by vehicle', Est. *aja-* 'chase, drive; ride in vehicle', Liv. *aja-* 'drive, chase', Lapp *vuoggjet* 'carry by vehicle', Votyak *uj(i)-* 'pursue', Komi *voj-* 'break through', *voj-lj-* 'run', Vogul *vuj-t* 'pursue'. Borrowing of **ag-* < **ak-* (cf. Lat. *agō* '(I) lead', OIcel. *aka* 'go by vehicle', Toch. B *āk-* 'lead') is assumed, with replacement of **g* by Fi-U **j* (Joki 1973:247-48). The source could have been an Indo-European dialect with voicing of Series I stops (Italic, Celtic, Baltic, Slavic). However, borrowing of an early Iranian form with **až-* < **ag-* and replacement of Iranian **ž* by Finno-Ugric **j* cannot be ruled out.

Fi-U (or Finno-Volgaic) **onke*: Finn. *onki* 'hook', Veps *onŋ*, Est. *õng*, Lapp *vuog'gâ* 'hook', Cheremis *onŋâ, ongo* 'hook, ring': see Joki 1973:295-96, Collinder 1974:365. The word could have been borrowed from an Indo-European form like Lat. *uncus* 'hook' (PIE **onkʰ-o-*). However, it could also have come from early Iranian (cf. Avest. *aka-* 'hook', *anku-pəsəmna-* 'one who

particularly the Araxes (*Ar-aks*) and Aragvi (*Ar-agw-*), is of interest. (The first element *ar-* may go back to the Indo-European root **r-* 'move, flow'.)

62. In some instances, however, it is impossible to formally distinguish loans of this structural type from early Iranian ones.

decorates self with hooks', with Iranian *a* before *n* reflected as *o*: cf. **onća*, 12.5.4 above).

Fi-U **luke*: Finn. *lukea* 'count, read, say, consider, teach', *luku* 'number, account; reading', Lapp *lokkât* 'read, count, narrate', Mordv. (Erzja) *lovoms* 'count, consider', Cheremis *luđam* 'count', Votyak *ljd* 'number', Vogul *lořant* 'count' (Joki 1973:278). Comparable to PIE **leḱ*'-/ **loḱ*'-: cf. Lat. *legō* '(I) pick, choose, read', Alb. *mb-ledh* 'collect, gather harvest'. It can be considered an early borrowing from Indo-European (Jokl 1921:111-12, Collinder 1955:131). Borrowing can be assumed on the basis of the semantics of the Finno-Ugric word, which reflects a derived cultural meaning of the Indo-European word ('count', not 'gather'). The phonetic form of the Finno-Ugric word reflects the glottalization of Indo-European **k*' with a voiceless *-k-*. It is interesting that early Iranian loans with voiced stops going back to the Indo-European glottalized Series I are regularly rendered with voiced consonants in Finno-Ugric. This shows that Finno-Ugric has different kinds of Indo-European loans: those from archaic dialects which preserved the glottalized series without voicing, and those from other dialects, primarily Iranian, where the original Indo-European stop system had been transformed.

Fi-U **vos(a)*:- Finn. *osta-* 'buy', Est. *ostaa* 'buy', Liv. *vostâ*, Lapp *ãsēs* 'trade, commerce', Cheremis *uža* 'price', *wâžale-* 'sell', Votyak *vuz* 'merchandise, trade', *vuzal-* 'trade, deal', Komi *vuz-ēs* 'merchandise', *vuzal-* 'sell', Vogul *weta*, *wāta(-χum)* 'merchant' (Lytkin and Guljaev 1970:70). Borrowed from Indo-European, cf. Lat. *uēno* 'sale' (dat.; from **wesno-*): see Joki 1973:298.

Finno-Volg. **oksa*/**oska*: Mordv. (Erzja) *ukso*, *uks* 'ash tree', Cheremis *o-škâ*, *oško* 'ash'. From PIE **oskhā*, cf. OIcel. *askr*, OE *æsc* 'ash' (see Joki 1973:333, P. Friedrich 1970:95; and II.4.1.5.1 above).

Fi-U **kal-w3*: Finn. *käly* 'brother's wife; wife's sister', Est. *käli* 'husband's brother; husband's brother's wife', Liv. *kālu* 'brother's wife', Mordv. (Moksha) *k'el* 'husband's brother's wife', Votyak *kali* 'term of address used by younger daughter-in-law to older', Komi-Zyr. *kel* 'brother's wife' (used by the wife of one brother to the wife of another). Can be compared to an Indo-European term for affinal kinship, cf. Lat. *glōs* 'husband's sister, brother's wife', ChSl. *z"l"va* 'husband's sister'; here cf. also Semitic **kall-at-* 'son's or brother's wife', Turkic **kalin* 'daughter-in-law' (Illič-Svityč 1971:I.295-96, Joki 1973:267-68, Collinder 1974:366).

Fi-U (Uralic) **teke-*: Finn. *teke-* 'do', Lapp *dâkkât* 'do', Mordv. (Erzja) *t'eje-* 'do', (Moksha) *t'ijâ-* 'do', Hung. *tenni* 'do'. Can be compared to PIE **dheH-*, cf. OLat. *fēcī* 'did' (Joki 1973:327-28, Illič-Svityč 1971:I.224, Collinder 1974:367).

Fi-U **veta-*: Finn. *vetä-* 'lead', Cheremis *wiše-*, Mordv. (Erzja) *véďa-*, Hung. *vezet-* 'lead'. Comparable to Indo-European **Hwedh-*, cf. Lith. *vėdinti* 'lead; get married' (see II.7.6.1 above).

Uralic **toke*: Finn. *tuo-da* 'carry, lead', Lapp *duoḱa-* 'buy', Mordv. (Erzja) *tuje-* 'carry, give', Vogul *tū-* 'carry', Ostyak *tū-* 'carry'. Comparable to PIE **t'oH-* 'give' (Joki 1973:331).

Fi-U **weye/*wiye* (Collinder 1974:366): Finn. *vie-* 'lead', Lapp *wijke-*, *vī'kkə-* 'lead', Mordv. (Erzja) *vije-*, (Moksha) *vije-* 'carry', Komi-Zyr. *vaj-* 'carry', Hung. *viv-* 'carry'. Comparable to PIE **weǵh-* 'carry in vehicle', cf. Lat. *vehere* 'carry in vehicle, go in vehicle', Lith. *vežù* '(I) carry in vehicle', OCS *vezq* '(I) carry in vehicle' (Joki 1973:345-46).

Uralic **uete*: Finn. *vesi* 'water', Mordv. (Erzja) *ved*, (Moksha) *ved'*, Cheremis *wət*, Komi-Zyr. *va*, Vogul *wit*, Hung. *víz*. Comparable to PIE **wet'-* 'water', cf. Goth. *watō* 'water' (Joki 1973:344).

The small group of words surveyed here, which show formal similarity to Indo-European words and with few exceptions are distinct from early Iranian and Tocharian forms, can easily be identified with words from those Indo-European dialects — the Ancient Indo-European dialects — that separated out early in the course of their migrations and later moved westward to the European part of the Eurasian continent, possibly meeting Finno-Ugric speakers on their way. See also Koivulehto 1983 for a number of Finnish words etymologized as early borrowings from the dialect groups ancestral to Germanic and Balto-Slavic.

12.7.3. *Lexical isoglosses as evidence for the joint development of the Ancient European dialects*

During their migrations westward from Central Asia, the Ancient European dialects must have been a single linguistic community with little internal dialect division, and with a number of lexical innovations distinguishing them from the other Indo-European dialects which had differentiated from the protolanguage by that time. These Ancient European innovations for the most part involve lexical semantics and the application of ancient words in new meanings unique to this dialect grouping; there are also several new words not represented in the other Indo-European branches.

Semantic innovations setting the Ancient European dialects apart include the following.

PIE **theu-th-* used in the meaning 'society, folk, people': OIr. *túath* 'people', Welsh *tūd* 'country', Gaul. *Teut-* (in personal names), Osc. *tōwto*, *touto*, Umbr. acc. sg. *totam* 'ciuitatem', Goth. *þiuda*, Oícel. *þjóð*, OE *þēod*, OHG *diot(a)* 'people, folk', *diutisc* 'of the people' (Ger. *deutsch*); Illyrian personal names with first element *Teut-*; OPruss. *tauto* 'country', Lith. *tautà*, Latv. *tàuta* 'people, folk' (Krahe 1954:63-70, 1968, Porzig 1954:200 [1964:294-

95]). Cf. the different meaning in the other Indo-European dialects: Hitt. *tuzzi-* 'army' (see Schmid 1977:107, Szemerényi 1976:100-108).

PIE **mor(i)-* used in the meaning 'sea': OIr. *muir*, Lat. *mare*, Goth. *marei*, OHG *marī* (Ger. *Meer*), Lith. *mārės* (pl.), OCS *morje*, against the meaning 'stagnant water, swamp' in the other dialects: Hitt. *marmara-* 'swamp', Oss. *mal* 'deep stagnant water', Arm. *mawr* 'swamp' (Poetto 1973).

Lexical innovations shared by these dialects include:

Ancient European **pheiskh-* 'fish': OIr. *íasc* 'fish', Lat. *piscis*, Goth. *fisks*, OIcel. *fiskr*, OE *fisc* (Engl. *fish*), OHG *fisc* (Ger. *Fisch*) (Porzig 1954:110 [1964:165]).

AEur. **phl-ā-r-/n-* 'earthen floor, threshing floor, field': OIr. *lár* 'floor (of earth), threshing floor', OIcel. *flórr* 'floor of cattle shed', OE *flōr* (Engl. *floor*), MHG *vluor* 'floor, meadow' (Ger. *Flur*) (Porzig 1964:178-79).

AEur. **k̑rno-* 'grain, corn': OIr. *grán* 'grain', Lat. *grānum*, Goth. *kaurn*, OPruss. *syrne*, Lith. *žirnis*, OCS *zrño* 'grain'.

AEur. **bhar-*: Lat. *far*, gen. *farris* 'spelt', Umbr. *far*, OIr. *bairgen* 'bread', Goth. *barizeins* 'made of barley', OIcel. *barr* 'grain, barley', OE *bere* 'barley' (cf. Engl. *barley*), Serbo-Cr. *bār* 'type of millet'. The word is considered a borrowing from Semitic: cf. Hebr. *bar* 'threshed grain', Arab. *burr-* 'wheat' (see II.11.3.2). It must have entered these dialects while they were still in the Near East and in contact with Semitic.

12.7.4. *The northern Black Sea and Volga region as the joint territory of the Ancient European dialects. The secondary Indo-European homeland*

The westward movement of Ancient European dialects from Central Asia evidently took place in repeated waves of migration to western Eurasia, where these tribes subsequently settled some common territory. New arrivals joined earlier settlers to form an intermediate homeland shared by the tribes which later moved on to the more western zones of Europe. This intermediate settlement area thus became a zone of contacts and secondary rapprochements of dialects which had partially differentiated before this. This is where the common lexical and semantic innovations were able to arise.

The interaction of these dialects is an example of a secondary linguistic area of ultimately related languages. The out-migration of the dialects from this secondary area — a secondary, or intermediate, proto-homeland — to central and western Europe laid the foundation for the gradual rise of the individual Italic, Celtic, Illyrian, Germanic, Baltic, and Slavic languages. The name Ancient European reflects not the secondary homeland of this group but the territory they occupied in historical times.

The northern Black Sea and Volga steppes thus form the common, albeit

secondary, homeland for the Ancient European group. On this view, the theory placing the Proto-Indo-European homeland in this region acquires a new status as a hypothesis regarding the homeland of the western group of Indo-European languages. This temporary common territory was a region where various migratory waves moved, and where secondary isoglosses formed and were superimposed on earlier ones linking these dialects with other Indo-European languages which had migrated in other directions. It was en route to this secondary homeland that contacts of Ancient European dialects with speakers of Central Asian languages were able to take place, resulting in loans into Finno-Ugric and loans from Altaic such as **morkh-* 'horse' and others.

12.7.5. Evidence for the joint existence of the Ancient European dialects in the secondary homeland from the ancient hydronymy of the northern Black Sea area

Traces of an Ancient European sojourn in the secondary homeland can also be found in hydronyms of the northern Black Sea area (in the territory of the Ukraine and Moldavia) which, when later strata of names (in particular Slavic and Iranian: see above for names like Don, Dnieper, etc.) are removed, show traits distinctive of early Indo-European hydronymy also attested in Central Europe. They include words of the following types, in which the similarities to Ancient European roots and suffixes show their Proto-Indo-European character.

Soluč-ka (from **solqtj-* < **salantyā*): see Trubačev 1968:131-32; cf. Lith. *Sālantas*, and *Salontia* in Switzerland (a tributary of the Rhone); an **-nth-* stem (Krahe 1960).

Brescia (from **brent-*), cf. the river name *Brenta* in the Veneto (*Brendisium* in lower Italy): Trubačev 1968:177.

Murava, coinciding with Central European *Morava*, *Morawa* on the upper Vistula; cf. the classical *Marus*, the *Maraššanda-* in ancient Anatolia (see II.11.1.2).

Al'ta, ORuss. *L'tica*, which coincides with *Áltos* in ancient Macedonia, *Alto* in Illyria, *Altinum* in the Veneto (see Krahe 1960), and the Anatolian *Alda* (cf. Hitt. *aldanni-* 'spring').

Hydronyms in *-pa* such as *Strypa*, which admit interpretations on the basis of various early Indo-European dialects (see Toporov and Trubačev 1962:171, 176, 197 et pass., Trubačev 1968:152-58); cf. also Anatolian hydronyms in *-hap-*, II.11.1.2 above.

Romen, cf. Lith. *Armenà*; *Armeno* in the Trient area; Ancient European *Armenta*, *Armantia* (see Trubačev 1968:209).

A number of names in *-kva* such as *Murakwa*, *Ikva*, comparable to Illyrian and Baltic names (cf. *Ikva* in western Hungary): Trubačev 1968:62-67.

Typically the ancient Indo-European hydronyms are preserved for small rivers and tributaries of major ones, while the major rivers are renamed upon the arrival of new ethnic groups, as with the Iranian names of the major eastern European rivers (Don, Dnieper, Dniester, etc.).

The oldest hydronyms of the Volga region and Central Asia have received very little historical study, so that at present no traces of ancient Indo-European passage through these areas can be brought to light.⁶³

12.7.6. The secondary homeland as the formative area of Ancient European–East Iranian lexical ties. Scytho-European isoglosses

In the areas approaching the Black Sea and Volga steppes where the westbound Indo-European tribes concentrated, contacts with early Iranian dialects were also possible. Of particular interest in this connection are a number of words and mythological themes common to East Iranian and Ancient European languages, the ‘Scytho-European isoglosses’ of Abaev 1965:

Oİcel. *ql*, OE *ealu* (Engl. *ale*), OSax. *alo-* ‘beer’; OPruss. *alu*, Lith. *aliùs* ‘beer’, OCS *olŭ*, ORuss. *ol*”, *oluj*: Oss. *ælŭton* ‘beer’ (Abaev 1949:I.338-47, 1958:I.129-31).

Lat. *uirga* (< **uis-ga*) ‘twig, switch’, Slav. *věxa* ‘shield’ (from **weisa*): Oss. *wīs/wes* ‘twig, switch’ (Abaev 1965:20-21).

Lat. *armus* ‘forearm, shoulder blade’, Goth. *arms* ‘arm’, OHG *arm* (Ger. *Arm*), OE *earm* (Engl. *arm*), OCS *ramo* ‘shoulder’: Oss. *arm* ‘arm’, Pamirian Wakhi *yurm*, Yidga *yārmē* (Abaev 1958:I.68, 1965:30-31). The presence of the word in Pamir languages points to the great antiquity of contacts between Ancient European and Iranian dialects in Central Asia.

Lat. *grānum*, Oİr. *grán*, Goth. *kaúrn*, OPruss. *syrne*, Lith. *žirnis*; Pashto *zəṇay* (from **zṛna-ka*) ‘grain’ (Abaev 1965:13). The word may testify to earlier contacts of East Iranian and Ancient European dialects in Central Asia.

Lat. *portus* ‘port’, *angi-portus* ‘narrow passage’, Gaul. *ritu-* ‘ford’, OHG *furt* ‘ford’, OE, Engl. *ford*, Oİcel. *fjorðr* ‘fjord; small ocean bay’: Oss. *fürd/ford* ‘large river’, Scythian *Pórata* ‘river Prut’, Avest. *pərətu-* ‘crossing, ford, bridge’. An East Iranian borrowing of an Ancient European word for a crossing over a body of water (see II.5.3.6).

OHG *lahs* (Ger. *Lachs*), Oİcel. *lax* ‘salmon’, OPruss. *lasasso* ‘salmon’, Lith. *lāšis* ‘salmon’: Oss. *læsæg* ‘salmon’, cf. Toch. *laks* ‘fish’. Specialized in the meaning ‘salmon’ (instead of the possible original meaning ‘spotted fish’, see

63. A special problem is presented by the possibility that Southwest Asian river names were carried to eastern Europe by Ancient European speakers. Of great interest in this connection is the river name *Ovrad*, widespread in the northern Black Sea area and comparable to the name Euphrates but not regarded as an Iranicism (Trubačev 1968:94, 260).

II.2.2.10.2). The word is shared by Ancient European dialects and East Iranian (Ossetic). The meaning 'salmon' could naturally arise in areas where salmon are found — regions adjacent to the Aral and Caspian Seas. Tocharian shows a shift to the generic meaning 'fish'.

OCS *pīsatī* 'write', Lith. *piěšti* 'sketch, write'; Oss. *fyssyn* 'write', Sogd. *py'st-* 'decorated'; Toch. A *pik-*, *pek-*, B *pik-*, *paik-* 'write'. A semantic innovation of Balto-Slavic, East Iranian, and Tocharian, while the old meaning 'decorate, draw' is preserved in some early Iranian dialects (cf. Avest. *paēs-* 'decorate'), Sanskrit (*piṁśāti* 'decorates'), and Latin (*pingō* '(I) draw, paint'). The specialized new meaning could have arisen in part of the Ancient European dialects, East Iranian, and Tocharian during their contacts in Central Asia.

Cf. also Ir. *cercc* 'chicken': Oss. *kark* 'chicken', Wakhi *kərk*, Pashto *čərg* 'rooster', Toch. B *kraŋko* 'rooster' (see Wagner 1969:227).

12.7.7. *The secondary homeland and the problem of Balto-Slavic-Aryan lexical isoglosses*

Speakers of Ancient European dialects evidently moved from Central Asia in repeated waves of migration, settling in the intermediate Black Sea-Volga area where they were able to form a distinct dialect community. In this area they must have come into contact with Aryan tribes who arrived there, possibly still earlier, via the Caucasus (see 12.5.2 above). Traces of Ancient European-Aryan contacts may be seen in Balto-Slavic-Aryan lexical isoglosses which can be dated to level 5 of the Proto-Indo-European dialect division (see I.7.5.2 above).

Lith. *šyvas* 'gray-white', OCS *sivŭ* 'gray, black' (horse color): Skt. *śyāvā-* 'black-brown, bay', Avest. *syāva-* 'black'.

OPruss. *kirsnan* 'black', OCS *črŭnŭ* 'black': Skt. *kṛṣṇá-* 'black'.

Lith. *māras* 'plague, epidemic', OCS *morŭ* 'death, plague': Skt. *māra-* 'death'.

Lith. *dėšinas*, OCS *desnŭ* 'right': Skt. *dákṣiṇa-* 'right', Avest. *dašina-* 'right'.

The relatively late, level-5 character of these Balto-Slavic-Aryan lexical isoglosses is also shown in their meanings, which involve specialized terminological vocabulary.

12.7.8. *The spatial and temporal correlation of the secondary Indo-European homeland with the Kurgan culture of the Ural-Volga steppes in the third millennium B.C.*

The secondary homeland was settled in the third millennium B.C. not only by the Ancient European tribes as a dialect grouping but also by Aryans and



Map 2.
The early Pit-Grave culture-historical area and its variants
(after Merpert 1974:153)

possibly other Indo-European tribes. This region at this time is the area of what is known as the Kurgan culture (also Pit-Grave Culture, Russian *Drevnejamaja kul'tura*).⁶⁴ This culture was spread from the northern Black Sea area to the Volga steppe and the Aral Sea. The features of the culture reconstructed from material remains are compatible with the culture reconstructed for Indo-European on linguistic evidence.

The Kurgan culture of the third millennium B.C. is characterized by the presence of stockbreeding and agriculture, wheeled carriages, use of the domestic horse as a draft animal, developed copper and then bronze metallurgy, and construction of fortresses in high places. Also characteristic of the culture are the distinction of social classes, the presence of tribal leaders and a special class of warriors, a significant number of religious symbols (solar chariot and others), and burial with cremation in a few instances (see Gimbutas 1968, 1973b, 1974).

A crucial factor, in light of the interpretation we propose for the Kurgan culture, is the fact that it shows connections with the Near Eastern world via both Central Asia (Merpert 1974) and the Caucasus (Gimbutas 1973b). Wheeled carriages of the Near Eastern type, metal artifacts with depictions of such animals as lions, scepters of diorite and other precious stones, and other material remains are evidence for this.

There has been little study of the early Bronze Age of the regions to the south and west of the Aral Sea⁶⁵ which lie between the third-millennium Kurgan culture area and fourth-millennium Central Asia and southern Turkmenia, an area which was within the orbit of the ancient Oriental cultural world (see

64. Chronology alone suffices to cast doubt on any identification of the later strata of the Volga-Black Sea Kurgan culture, dated by radiocarbon dating to the third millennium B.C., as the Proto-Indo-European culture, and consequently on any identification of this area as the 'primary' Indo-European homeland (see Schmitt 1974a). Chronologically, this culture and consequently this area can be identified with a particular part of the already-dispersed Indo-Europeans (see also Goodenough 1970:261, Watkins 1971:1502), probably the Ancient European speakers. For the chronology of the Kurgan culture see also Thomas 1970, Merpert 1974.

Marija Gimbutas has recently proposed a stratigraphy associating Kurgan 1 with the fifth millennium B.C., Kurgan 2 with the end of the fifth and first half of the fourth millennia B.C., Kurgan 3 with the end of the fourth millennium B.C., and Kurgan 4 with the beginning of the third millennium B.C. (Gimbutas 1974, 1977; see also Mallory 1977). Since there are still open questions concerning the possibility of uniting all the archeological cultures of this broad area into a single Kurgan culture, the question of the absolute dating of its earlier periods also remains open, even though radiocarbon dating has been used (see Neustupný 1970, Schmitt 1974a, Merpert 1974, Mallory 1976, Merpert 1977).

Identification of the Kurgan culture as specifically Proto-Indo-European, as proposed by Gimbutas in her many studies (see also Mallory 1977), also runs up against difficulties with the proposed routes of migration. If her claim of exclusively westward movements of these 'Proto-Indo-European' cultures is accepted, the lack of archeologically established evidence for the penetration of Tocharian, Indo-Iranian, and others to the east and southeast of this area (if we exclude an Indo-Iranian entry from the north via the Caucasus) becomes incomprehensible.

65. Also essential to research on the precise routes of migration is paleogeological investigation of the arid desert around the Aral Sea (which in the past was much saltier and much smaller in area than in most of historical times): see Martinson 1976:131-33.

Lisicyna 1978:21ff.). This makes it impossible to give a fuller picture of the historical connection between these regions and to reconstruct the archeological link uniting the cultures (see Merpert 1974, Leriche 1973). That reconstruction might establish an unbroken line of migration for Indo-European culture from the Near East to Central Asia via the eastern Caspian and from there to a new 'homeland' in the historically Indo-European regions of eastern Europe.⁶⁶



Illustration 20.
Rock paintings of carts. Sajmaly-Taš

The possibility should also be considered of Indo-European migrations by water, along the Caspian Sea route. The Indo-European lexicon reflects navigation terms (cf. **erH-/reH-* 'row', **naHw-* 'boat, vessel', **phleu-* 'travel by boat or ship', see above) and shows that the speakers of these dialects were familiar with the means for travel on large bodies of water. A water route would make understandable the almost complete absence of archeological and onomastic traces joining the original and later territories of the Indo-European tribes.

The Sintašta burial ground southeast of the Urals (in the village Rymninskij, Bredinskij district, Čeljabinsk province) is associated with ancient Indo-

66. Based on presently available archeological data, a cultural connection can be assumed between northern Iran and the Central Asian area to the Caspian Sea and beyond to the west. For north Iranian gray ceramic ware and its Central Asian connections see Deshayes 1960, 1969 (who considers it possible to associate these archeological connections with Indo-European migrations); for a comparison of gray ware from Iran, Asia Minor, and the Balkans see Thomas 1970.

European, and possibly early Iranian, migrations which took place no later than the first half of the second millennium B.C. It includes burials with traces of chariots and abundant animal sacrifices (primarily of horses, but also bulls, calves, sheep, goats, dogs): see Gening 1977. Certain details of ritual, like the rows of bulls' heads, bear a striking analogy not to Iranian materials but to the Near East, beginning with Çatal Hüyük.

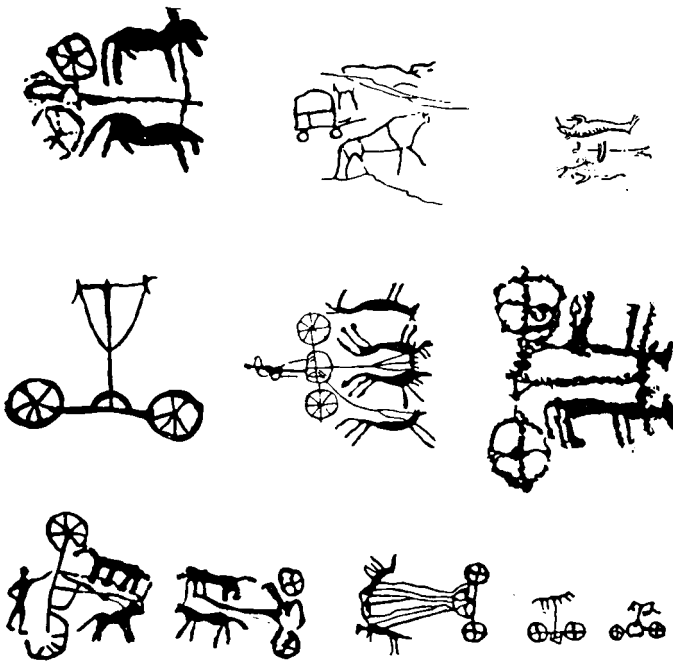


Illustration 21.

Rock paintings of carts and chariots from southern Siberia and Mongolia
(after Šer 1980:197)

We can also trace the trajectory of horse-drawn carts from their point of origin in the Near East eastward to Central Asia and farther to the northeast, using the petrographic depictions of such carts and horses found in great quantities from the Fergana range (Sajmaly-Taš) onwards to southern Siberia and Mongolia; they date to the Bronze Age (third to second millennia B.C.): see Littauer 1977, Piggott 1979, Šer 1980:194ff. Significantly, the spread of horse-drawn wheeled carts as reconstructed from the distribution of these cliff drawings largely coincides with the routes of spread we propose, which took the Indo-Europeans from the Near East across the Iranian plateau to Central Asia

and farther to the northeast, to the ancient territory of Turkic and Mongolian. This makes it highly probable that future archeological investigations in areas where such petroglyphs are found will uncover actual remains of these carts and objects of material culture carried to these regions by migrating Indo-European speakers.

The movements of speakers of Indo-European dialects that later developed into Tocharian and Ancient European (and the East Iranians who bordered on them) evidently resulted from economic factors typical of the Eurasian steppe zone after the end of the fourth millennium B.C. At that period the economy was primarily based on stockbreeding, which required opening up new pastures and frequent relocations. Huge societies formed, internally divided into large tribal groupings. This changed the character of migrations. There were rapid displacements of large masses of population, united in powerful (although temporary) tribal unions. Migrations of this type led to the spread of cultural and economic achievements over vast territories. This is Merpert's *third model of migration* (1978:12-13; cf. also Schlerath 1973:18ff.). It is this type of migration that could have produced the dispersal of Tocharian, Ancient European, and East Iranian speakers throughout the vast Eurasian steppe and beyond to Central Europe by the end of the third millennium B.C.

The hypothesis has recently been advanced that the great migrations of the end of the third millennium B.C. (like the following wave of migrations, connected with the 'peoples of the sea', ca. 1200 B.C.) were in part triggered by the substantial climatic warming that occurred at that time. The usable land area decreased, especially in Central Asia, which necessitated migration of much of the population to new territories (see Brentjes 1979).

12.7.9. The advance of Ancient European dialect speakers into Central Europe and the formation of Central European hydronymy. The formation of the separate Indo-European languages of ancient Europe

The movement of ancient Indo-European tribes to the west, northwest, and southwest which had begun in the mid-third millennium B.C. became especially intensive toward the end of the third millennium B.C. This is the date to be assigned to the Corded Ware and Battle-Axe cultures in Europe. The overall Corded Ware culture of eastern Europe divides into a number of subtypes: Middle Dnieper (Artemenko 1967), Subcarpathian (Svešnikov 1974), Gorodsko-Zdolbickaja, Strižovskaja, and others (Berezanskaja 1972, 1975). Both the Corded Ware subcultures and the related subtypes to the west and southwest have their origin in the Kurgan culture of eastern Europe (see Gimbutas 1973b:185-86, Thomas 1970:208; also Sulimirski 1968, Childe 1950:151).

Movement of Ancient European dialect speakers westward from the northern Black Sea area can be determined from burial types found in Europe as well as from their symbolism, which coincides with that of the Kurgan culture (see Kraig 1978).

A westward trajectory that carried the Ancient European speakers from Central Asia to Europe can also explain a number of immunological phenomena observed over the migrational history of the Eurasian continent. If the ancient Indo-Europeans are assumed to have lived for a considerable time in some part of Southwest Asia, an area subject to infectious diseases and especially plague (which had an Egyptian and ultimately African center of origin: see II.9.3.11), light can be shed on the subsequent geographical distribution of the population type having immunological resistance to plague. This population assumes a wedge-shaped distribution from Central Asia to eastern Europe, tapering off toward western Europe. Significantly, the plague of eastern Asiatic origin affected the population of Europe (excluding Greece, which in this respect belongs to the ancient Orient) only during the era of the great migrations, when *Pasteurella pestis mediaevalis* became dangerous (see Le Roy Ladurie 1978:51). In other words, the westward movement of the Kurgan culture people failed to bring the plague to Europe. This is explicable only if we assume that the population from which the Kurgan culture peoples originated had long since undergone immunological selection by being subject to the systematic effects of ancient epidemics of plague.

It is significant that the Ancient European dialects and Greek have a word for 'marmot', 'suslik' (a Eurasian steppe gopher), 'shrew', an animal which is a dangerous carrier of the plague: Lat. *sorex*, Latv. *susuris*, Bulgarian *sasar* (reduplicated), Gk. *húraks*; a doublet with *-l-* instead of *-r-* such as Russ. *suslik*, Bulg. *sasel* may have entered Turkic as well. It should be noted that a connection of the shrew with death, which can be assumed from the burial of shrews in tombs of priestesses as early as Çatal Hüyük, is also preserved in the Greek-Aegean-Asia Minor ritual complex (see Grégoire 1949).

The entry of Indo-European tribes into central and western Europe from their Black Sea-Volga secondary homeland brings about the rise of a distinct tribal grouping in central Europe. The variegated cultures of the second millennium B.C. are replaced by a uniform culture by the beginning of the first millennium B.C., when the homogeneous Únětice and then Urnfield cultures arise in central Europe (Gimbutas 1965:296-355). This uniform culture is associated with the territories of the Proto-Celts (the upper Rhine), the Proto-Italic tribes (in the vicinity of the Alps), the Illyrians (southeastern Europe and eastward to southern Poland: see Milewski 1964, Malinowski 1974), the Proto-Germanic tribes (in central Europe), and the Balts and Slavs (east of the Germans and north of the Illyrians): see Sedov 1976:85-86, Bosch-Gimpera 1968, Birnbaum 1973, Tovar 1977.

Also correlated with this unified archeological area is the territory of Ancient European hydronymy, whose shared features are based on the coincidence of many stems and suffixes: forms in *-a* (*Alba, Ara, Ava*), *-na* (*Adrana, Albina, Regana*), *-ma* (*Alma, Arma*), *-ma/ena* (*Almana, Warmena*), *-ra* (*Alara, Visara*), *-ntia* (*Alantia, Arantia, Avania*), *-mantia* (*Armantia*), *-sa, -sia* (*Amisia, Varisia*), etc. (see Krahe 1954:58, 1968 [1957]:435-36, Dauzat et al. 1978:18, Tischler 1977a:26). Significantly, a number of these hydronyms show resemblances to those of ancient Anatolia; cf. also the coincidence of the Central European (Celts-Illyrian) toponym *Arlape, Erlaf* (Toporov 1975-:I.102) with Hitt. *Ḫarašḫapaš*, or of Illyrian *Serapilli*, Balto-Prussian *Serenappe, Serappin, Sarape* (Toporov 1977:94) with Hitt. *Šuranḫapaš* (beside Vedic *Harīyūpīyā*, Iranian *Haliāb, Ariob*, etc.). Despite the vast geographical and chronological distances separating these various Indo-European dialects, they nonetheless continue ancient models inherited from Proto-Indo-European for deriving place names and names of bodies of water.

Speakers of the Ancient European dialects formed compact groups in Central Europe, superimposed on the local cultures and gradually assimilating them. Separate islands of the local cultures remained at first; some persevered through the Early Bronze Age. A north Pyrenean relic of these non-Indo-European tribes who once inhabited the entire European continent may be the Basques, whose language has miraculously withstood the impact and historical expansion of the Indo-European languages descended from the Ancient European dialects (see Wilbur 1980).

Great antiquity has recently been claimed for several pre-Indo-European cultures of western Europe⁶⁷ which formed a substratum to the cultures of the Indo-European arrivals. Relics of their languages appear in substratal vocabulary found in the historical Ancient European languages (see Hubschmid 1960, 1963, 1965). A distinctive feature of these cultures, found in a continuous coastal band from Scandinavia to the Mediterranean (the southern extremities of Norway and Sweden, Denmark, the Orkney Islands, Ireland, Great Britain, Holland, northern Germany; farther south, Brittany, southwestern France, the west and south of the Iberian peninsula; North Africa; the Mediterranean islands, the western Caucasus), is the presence of dolmens, menhirs, and cromlechs — megaliths which had cultic functions (see Markovin 1978; map of megalith distribution, p. 312). The western European megalithic culture is claimed to have arisen under influence emanating from the eastern Mediterranean (see Daniel 1941, 1958). However, recent radiocarbon dates showing great antiquity for the megaliths of the Iberian peninsula and Brittany (ca. fifth to fourth millennia B.C.: C. Renfrew 1974, 1976) cast doubt on this claim (see

67. For a chronology of ancient western Europe based on radiocarbon dating see C. Renfrew 1974, 1976.

Xazanov 1978:17) and necessitate a reinterpretation of the interrelationships among the different local varieties of ancient megalithic cultures.

12.8. The diffusion of physical types in Eurasia in relation to the picture of Indo-European migrations

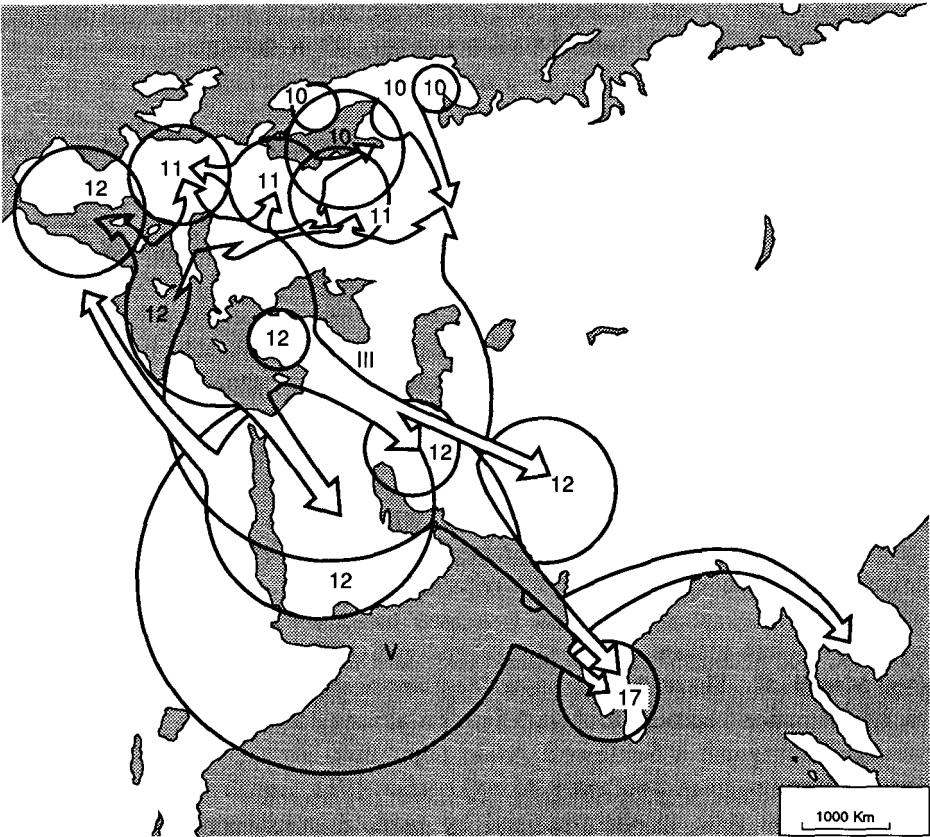
12.8.1. The diffusion of the ancient Southwest Asian physical type in western Asia and Europe as a reflection of ethnic blending

The non-Indo-European linguistic substrata of the autochthonous population of ancient Europe facilitated the gradual differentiation of the Ancient European dialects and the rise of the separate Celtic, Italic, Illyrian, Germanic, Baltic, and Slavic linguistic groups. Contacts among these languages would still have been possible, with consequent formation of shared lexical isoglosses reflected in the diagram of dialect differentiation at level 6 (see I.7, Fig. 3, and I.7.5 above).

The trajectory proposed here for migrations of the Indo-Europeans from a center in Southwest Asia to new territories in Eurasia, and for their contacts with speakers of other languages, correlates to some extent with the physical-anthropological picture of migrations and racial blending in western Europe (see Map 3).⁶⁸ There is an eastern Mediterranean, Balkan-Caucasian area of racial formation centered in Asia Minor (Alekseev 1974:224-25). In this area we can distinguish a Southwest Asian population group, widely attested on ancient monuments in Southwest Asia (Luschan 1911, Bunak 1927, Field 1961). This physical type is characterized by marked brachycephaly, intensified development of facial and body hair, and a distinctive nose form (depicted, for example, in Hittite reliefs). It is typical of the tribes who were in contact in the ancient Near Eastern area, including the southern Caucasus, Asia Minor, and northern Iran, at a certain chronological level (Abdušelišvili 1966). From this area it spread, with some changes, to Afghanistan (in particular Nuristan: Herrlich 1937) and northern India (the so-called Indo-Afghan race: Debec 1967). It is related to the physical type of the Bronze Age population of Central Asia and the contemporary Pamir-Fergana type (Alekseev 1974:222-23). The eastern Mediterranean type is also represented in Europe, where it blends with earlier types — northern, southern, and central-eastern, the latter with Mongoloid admixture — which represent the original population (Alekseev 1974:225-41).

Our claim that the Proto-Indo-European speakers were of the Mediterranean racial type conflicts with the traditional view of the Indo-Europeans as fair-haired, blue-eyed, and dolichocephalic, a view drawn from the literary texts of

68. For a survey of earlier physical-anthropological theories in regard to the Indo-European migrations see Devoto 1962:47ff.



Map 3.

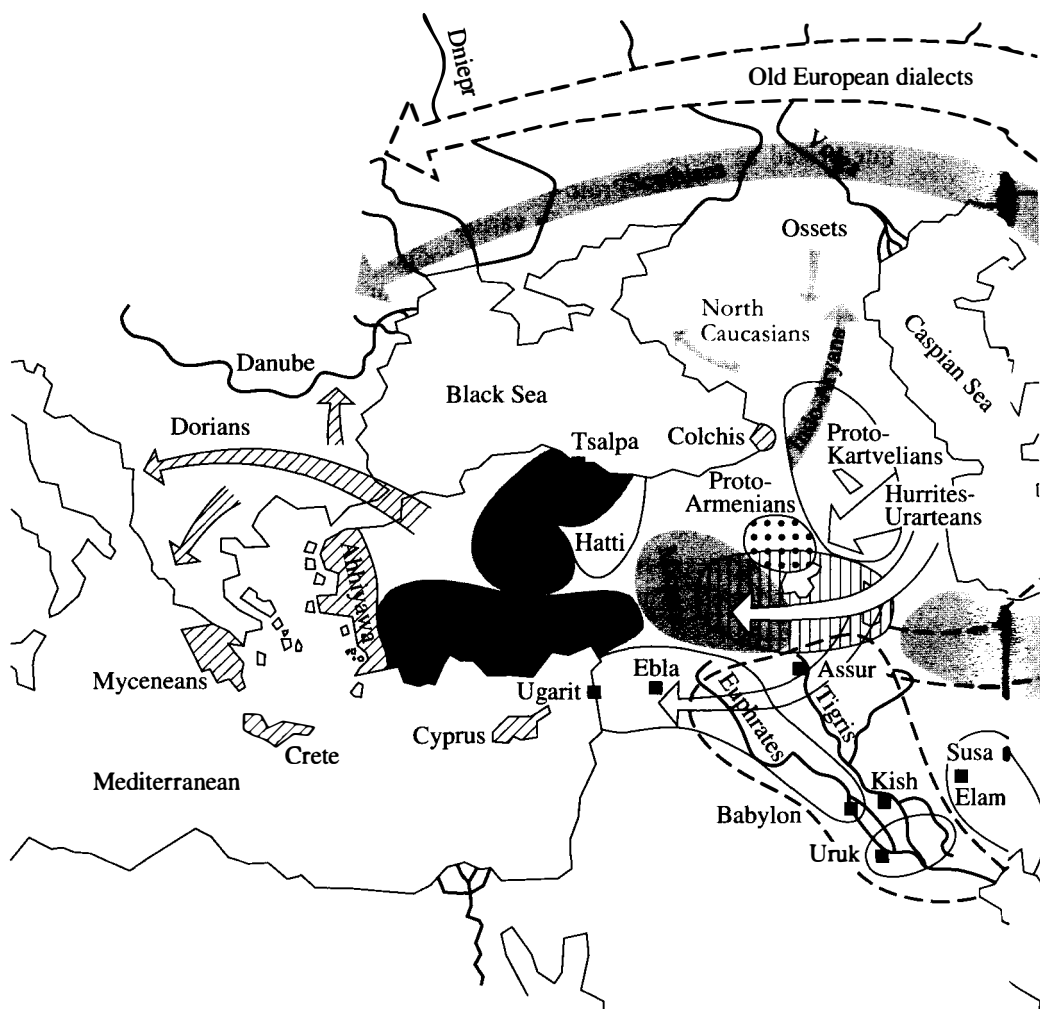
Centers of racial formation in Europe, Southwest Asia, and South Asia and dispersal routes of human groups (after Alekseev 1974:237)


the ancient Indo-European languages (cf. Lelekov 1982). There is a certain idealization of light skin and fair hair in the Old Indic and Greek traditions (e.g. Indra is characterized as fair, *hári-*), but this indicates that fair coloring was rare and phenotypically marked among the early Indo-Europeans; it cannot be interpreted as some kind of memory of the typical physical features of their ancestors who spoke Proto-Indo-European. There is special symbolic significance for the color white in various early Indo-European traditions, and it is connected with early Indo-European social organization, but there is no basis for regarding it as based on hair or skin color.

The assumption that the Indo-Europeans were blue-eyed found some currency when northern Europe was regarded as the original Proto-Indo-European homeland, but placing the homeland in Southwest Asia changes the physical type that must be assumed. The migrations of the early Indo-European speakers and their interactions with local populations in their new territories would eventually have brought about fundamental changes in their physical type. Such interaction must be assumed for northern Europe, where the Ancient European languages were superimposed on the local non-Indo-European languages in prehistoric times. The speakers of the ancient European languages could have been a dark-eyed population which was assimilated by the indigenous population. The outcome would have depended on the relative numbers of the indigenous and immigrant populations. The child of a dark-eyed and a light-eyed parent will be phenotypically dark-eyed but heterozygous, carrying a gene for light eyes which may become overt in the next generation if the gene for dark eyes is lost. Thus a pre-Indo-European population with light eye color, as in northern Europe, could have remained predominantly light-eyed even after being conquered by a dark-eyed population and adopting their language.

12.8.2. The final stages of Indo-European migration in the second to first millennia B.C.


The final stage in the intensive migrations and dispersal of ancient Indo-European dialect speakers is represented by the pressure exerted by part of the Ancient European tribes on the Balkans (and somewhat later the Apennine peninsula) in southeastern Europe in the second half of the second millennium B.C. Entering the Balkans, these tribes came into contact with Indo-Europeans who had lived there since their early migration from Asia Minor: speakers of ancient Balkan 'Thracian' as well as Phrygian, ancient Macedonian, and the Doric dialect of Greek. These late contacts led to the rise of Thraco-Illyrian linguistic formations such as Albanian, which includes a significant layer of Illyrian Ancient European (see Pisani 1959, Desnickaja 1968, Solta 1980). The pressure from the north set the Balkan Indo-European groups into motion; they




 Proto-Indo-European

 Greek

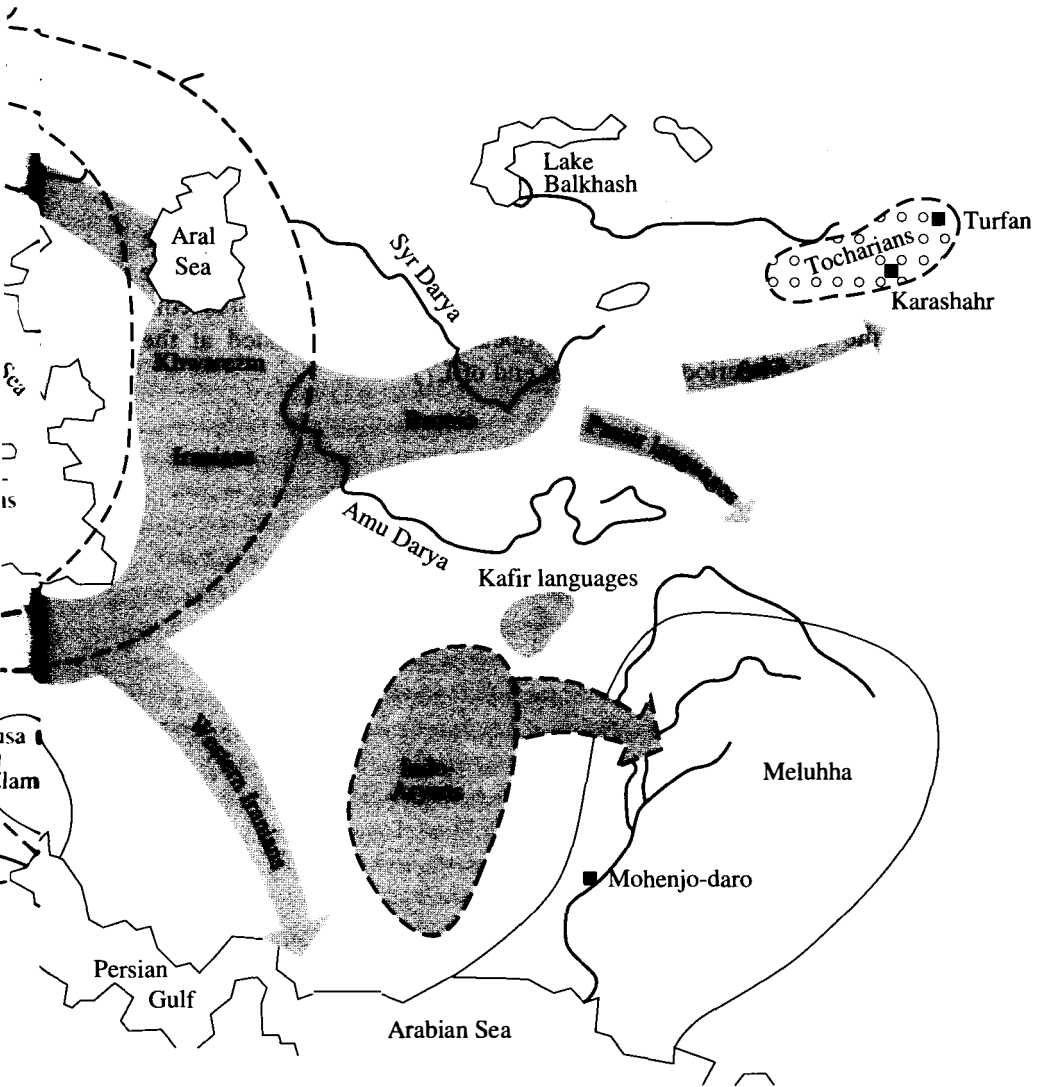
 Indo-Iranian

 Anatolian

 Proto-Armenian

 Tocharian

 Non-Indo-European



Migrations of speakers of ancient Indo-European dialects

began resettling to the south in mainland Greece (the Doric invasion)⁶⁹ or Asia Minor (the Phrygians). These intensive movements of large population masses were part of a general movement of peoples in the eastern Mediterranean, reflected in Egyptian sources as the invasion of the 'peoples of the sea' (Kimmig 1964). That invasion led to the fall of the Hittite kingdom and Mycenaean Greece around 1200 B.C. (see Deger-Jalkotzy 1977:62ff., 1978:28ff.).⁷⁰

The migrations described here for the Indo-Europeans took them from their original territory in the Near East and Southwest Asia to new territories, where they interacted with the indigenous populations (see Map 4). This resulted in the dispersal of Indo-European dialects over vast expanses of the Eurasian continent, and in the distribution of Indo-European languages attested at the beginning of the historical period (see map at end of I.7).

69. This view is opposed by the thesis that there was no Doric invasion from the north, but that the Dorians (Gk. *Dōrieîs*) had lived in Mycenaean Greece together with the other Greek tribes from the very beginning, having the social position of subordinate population in a country governed by a Mycenaean aristocracy which spoke a separate Mycenaean dialect of Greek. This explains the closeness of the Doric dialect to Mycenaean. The very name *Dōrieús* 'Dorian' has been connected with the Mycenaean word *do-e-ro* (Ion.-Att. *doûlos*) 'servant, slave' (Szemerényi 1982a). If this thesis is accepted, there is no longer any need to assume an early separation and migration of the Dorians to the Balkans independently of the remaining Greek tribes, who migrated westward across Asia Minor to their historical territory on the Peloponnesus and the Aegean islands (see note 10 above).

70. For the 'peoples of the sea' and the Dark Age that followed their invasion of the Near East and Aegean see Deger-Jalkotzy (ed.) 1983.

Instead of an Afterword

While this book was in preparation and in press a number of works consistent with the spirit of our linguistic and culture-historical theory have come out, as have the first critical responses to our preliminary publications. Without attempting a detailed evaluation and analysis of the many works that have appeared with direct or indirect relevance to the theory presented in this book, we nonetheless feel obliged to mention the major ones, in order to give some idea of the opinions held concerning our reconstruction of the Proto-Indo-European language, the protoculture, and the prehistoric migrations of the Indo-European dialects.

We should note that our first publications reanalyzing the Indo-European phonological system and especially the consonant subsystem have evoked lively discussion among specialists, which in turn led to studies based on the new theory of the Proto-Indo-European phonological system. The appearance of this theory was the obvious natural consequence of a tendency visible in historical-comparative linguistics toward typological reevaluation of the received protosystem, stimulated in historical linguistics by Jakobson's now-classic report to the Eighth International Congress of Linguists in Oslo in 1957. It is therefore no accident that almost simultaneously with our work and obviously independently of it analogous theories were advanced by the American linguist Paul Hopper (1973) and the French scholar A. Haudricourt (1975; cf. also Hagège and Haudricourt 1978:165ff.), who have proposed a Proto-Indo-European consonant system which, although slightly different from that of the present book (in the phonological interpretation of the voiced aspirates and voiceless stops), is based on analogous assumptions.¹ This new theory, following one of its earliest proponents and followers — the American scholar Allan Bomhard — has begun to be called the 'glottalic theory' in the technical literature. In this connection Bomhard has written: "The Glottalic Theory stands out as the single most significant contribution to the reconstruction of the Indo-European phonological system made during this century. The only possible competitor, the Laryngeal Theory, had its origins in the closing decades of the last century" (1979:80). Similar opinions have been offered recently by Henrik Bimbaum (1978) and by Edgar Polomé, who mentions that the glottalic

1. In subsequent works and especially in his paper of 1982, Hopper essentially accepts our phonetic interpretation of the Indo-European stop series II and III as voiced aspirates and voiceless aspirates respectively.

theory entails a reconsideration of the reconstructed phonological system of the Indo-European protolanguage and is "the most radical change proposed since the 'laryngeal theory'" (1982:viii).

The Austrian linguist M. Mayrhofer, one of the major contemporary Indo-Europeanists, sees the history of Indo-European studies as a gradual 'de-Sanskritization' (*Entsanskritisierung*) of the Proto-Indo-European model. He distinguishes five successive stages of development: Schlegel, Schleicher, the law of palatalization, the laryngeal theory, and the glottalic theory (Mayrhofer 1983).

It is therefore entirely natural that the new theory immediately found followers and proponents who have based their work on a reinterpreted Proto-Indo-European system. The German linguist P. Normier (1977) proposes an original interpretation of the Germanic phonological system, including Verner's Law, based on a variant of the glottalic theory which is in full accord with the model proposed in the present book. The Dutch linguist Frederik Kortlandt, in numerous publications on this topic, interprets the classical phonetic laws and some recently noted regularities in the evolution of Indo-European dialects in an approach using glottalized consonants; in several cases, in particular the account of Lachmann's Law (Kortlandt 1977), his interpretation agrees with ours. Analyzing certain regularities of length and accentual relationships in Balto-Slavic in the light of assumed glottalized consonants, he maintains that his interpretation may provide the same factual proof of the glottalic theory as Kuryłowicz's discovery that Hittite *ḫ* correlates with the 'sonant coefficients' posited by Saussure (Kortlandt 1979). Also of interest in this connection is Hopper's interpretation (1982:133) of the voicing in Skt. *píbatī* '(he) drinks' beside Gk. *pōthi* 'drink' (imper.), *pōsis*, Lat. *pōtus* 'beverage', etc.: if one of the laryngeals is interpreted as a glottal stop, the Indo-European root **p^heʔ-* 'drink' can be assumed to have yielded the sequence **pʔ-* in zero grade, which was identified with the glottalized **p'* and subsequently evolved in the same way, becoming voiced in Sanskrit: **p^hi-p^hʔ-e-t^hi > *p^hi-p'-e-t^hi > Skt. *pí-b-a-ti*.²*

On the analogy of the *centum/satem* classification of Indo-European dialects, Hopper proposes an areal classification based on the reflex of the glottalized Series I as voiceless or voiced, calling his classification the *decem/taíhun* division (based on the reflexes of PIE **t'ek^hm* 'ten', with an initial glottalized stop): Hopper 1981.

When glottalized stops are posited for Proto-Indo-European it becomes possible, as I. Melikišvili has shown, to deduce a structural regularity of the

2. Sapir's work (1938) on 'glottalized' sonants in Indo-European should be mentioned in this connection. Sapir interprets the so-called 'long sonants' **ī̄*, **ī̇*, **ñ̄*, **ñ̇*, whose rise had been attributed by Saussure to the effect of 'sonant coefficients' in the sequences **ī̄H*, **ī̇H*, **ñ̄H*, **ñ̇H*, as phonetically **ī̄'*, **ī̇'*, **ñ̄'*, **ñ̇'*.

Indo-European root: a sonority principle whereby the initial and final consonants of the biconsonantal root tend toward equilibrium in sonority. This is yet another structural trait of the Indo-European root which brings it typologically close to the Proto-Kartvelian root structure (I. Melikišvili 1980).

The glottalic theory has also found supporters among researchers in Russia (see Neroznak 1981). There have also been attempts by individual investigators to bring the data of the glottalic theory into accord with their own understanding of Proto-Indo-European phonological structure, for instance in questions concerning the interaction of the reconstructed Proto-Indo-European tones with the three consonant series (see Gercenberg 1981).

Acceptance of the new model naturally entails an obligation to completely reconsider the received view of the sound system of Proto-Indo-European and its dialects, i.e. to completely replace traditional views. We thus have a shift from the classic paradigm of comparative-historical Indo-European linguistics to a new paradigm in which the entire trajectory of Proto-Indo-European phonetic transformations takes a direction opposite to the traditional one.³ On this point the American linguist Philip Baldi (1981:52-53) observes: "It is clear that the glottalic theory is a new paradigm in Indo-European linguistics comparable in scope to the laryngeal theory. And when this theory is accepted, it will necessitate the complete reformulation of all the basic work in Indo-European studies... The fact that its acceptance will require a radical reworking of all the dictionaries and handbooks, as well as the discarding of such time-honored favorites as Grimm's Law and the Armenian consonant shift, is simply no excuse."

At the present time — over ten years after the first publication of our proposed consonant system (Gamkrelidze and Ivanov 1972) — only part of the Indo-Europeanists (primarily the younger and middle generation) have come out clearly in favor of the glottalic theory. The remainder are highly cautious in their judgments and pronouncements, which is fully understandable and further confirms the status of the glottalic theory as a new paradigm in comparative-historical Indo-European linguistics. The older generation is usually unwilling to part with old ideas and views, preferring to continue working, as it were by inertia, within the traditional and therefore more familiar paradigm even when weak and contradictory points of that paradigm become obvious. Hopper's conjecture (1982:129-30) concerning the possible strategy of this segment of Indo-Europeanists is apropos: "Will they try to show that the data used in the formation of the theory are incorrect (root structure constraints, distribution of

3. A rigorously defined notion of paradigm as applied to the history of scientific thought was introduced in Kuhn 1970. Despite a number of objections to the application of this notion to the history of science (and specifically linguistics: see Percival 1976), a somewhat modified notion of paradigm nonetheless seems to us to be highly fruitful for characterizing in general terms the stages of scientific development, and in particular for linguistics (cf. Koerner 1980).

**b*, morphophonemics of PIE mediae, point of articulation skewing⁴)? That the data are correct but irrelevant? Or compatible with some other typological data? Will they maintain that the theory is plausible but applicable to ‘pre-Proto-Indo-European’ and can be complacently ignored by ‘Indo-Europeanists’? Will they cast aspersions on the method of external reconstruction itself, in the hope that none of the internal evidence for the theory can be sustained? Perhaps, on the other hand, those who work in the traditional paradigm will find it less troublesome to ignore the radical revisions which have been presented during the last decade in the hope that these innovations will die of neglect (which is not likely to happen) or that, being accepted by a widening circle of scholars, the changes proposed will have no significant consequences for our view of Proto-Indo-European (an even remoter possibility).” We hope that this book’s detailed exposition of the theory and its consequences for Indo-European phonological structure and the dialect development that created the historical Indo-European languages will facilitate a thorough investigation of the theory and its consequences in terms of the new paradigm.

In the present study, the glottalic theory is connected with a problem of the laryngeal theory, the question of the number of ‘laryngeal’ phonemes in Proto-Indo-European and their reflexes in the historical Indo-European languages. We have developed the variant of the laryngeal theory proposed in our earlier work on this problem (Gamkrelidze 1960, 1968, Ivanov 1965), using three original laryngeal phonemes *H*₁, *H*₂, *H*₃ which determine the quality and length of vowels ([*e, *a, *o] respectively) and merge into a single laryngeal phoneme **H* after phonemicization of /**e, *a, *o*/. Just such a laryngeal theory, positing three (and no more) originally contrasting laryngeal phonemes with fricative articulation, has become dominant in recent studies (in addition to the literature cited above see in particular Peters 1980, which gives an original and extremely interesting treatment of the Greek reflexes of the three laryngeal phonemes, symbolized with *h*₁, *h*₂, *h*₃; see also Adrados 1981, Lindeman 1982).

The morphological and syntactic structure of Proto-Indo-European, which forms the object of study in the grammatical chapters of Volume I, is interpreted there from a typological-universal position which takes diachronic typology into consideration. We are pleased to see that an analogous approach

4. Hopper has in mind the high frequency of the traditional voiced labiovelar **g^w* relative to the voiced aspirate **g^wh* and voiceless **k^w*; the statistics (Jucquois 1966) are:

	voiced	voiced aspirate	voiceless
labial	0	129	143
labiovelar	37	12	18

These frequencies can be explained only by reference to phonetic properties of glottalized labiovelar consonants, which are distinguished by higher frequency relative to voiced and voiceless labiovelars (Hopper 1982:129).

has led to a certain identity of results in a number of recent works. This pertains primarily to the problem of ergative and active structure, which in recent years has become one of the central issues for grammatical typology and theoretical linguistics (see Dixon 1979). A general characterization of Proto-Indo-European grammatical structure using binarily opposed groups of nouns and verb forms associated with them is close to some of the conclusions of Schmalstieg 1980, a book which reflects the author's novel approach to problems of Indo-European morphological structure. An even closer coincidence with our account of Indo-European morphological structure — down to the terminology used for meta-designations — can be found in the works of K. Shields on the reconstruction of noun classes and their markers (Shields 1977, 1978) and of verb forms (Shields 1981a).

A particular focus of scientific interest in recent years has been the problem of language as an expression of its speakers' culture, which is the main object of study in Volume II. We have connected this problem to the question of the original Indo-European homeland and the movements of the Indo-European dialects to their historical territories as determined by the original migrations of speakers of these dialects. This traditional problem of classical Indo-European historical-comparative linguistics takes on a new interpretation in the light of current studies and is associated with the ethnogenesis of speakers of Indo-European dialects and the gradual spread of these dialects over a vast expanse of Eurasia.

Our hypothesis of an original Proto-Indo-European homeland in Southwest Asia, specifically a region straddling southeastern Asia Minor and northern Mesopotamia, in approximately the area of the Halaf culture of the fifth millennium B.C., seems to us to find even clearer confirmation in the light of recently discovered archaeological and culture-historical facts which could not enter into the writing of the basic text of this study. The Halaf culture, according to recent findings, is also characterized by a cremation ritual (Merpert and Munčaeв 1982), which — as shown above — is one of the major distinguishing features of the Indo-European funereal rite.

Not only in the proposed Proto-Indo-European territory, temporally and spatially correlated with the Halaf culture, but also in intermediate territories which the migrations of Indo-European dialects would have crossed, recently published archeological, linguistic, and culture-historical findings have come to light which can be interpreted as supporting the trajectory of movement we propose for these dialects. Important material for this question can be found in the proceedings of the Symposium on Ethnic Problems in the History of Central Asia in Antiquity. Of particular interest is an article by the Hungarian scholar J. Harmatta, who has also done earlier work on the Indo-European homeland. This paper (Harmatta 1981), like Abaev's contribution (Abaev 1981), gives a chronological stratification of Iranian loans in Finno-Ugric and other languages

and discusses a number of Indo-European–North Caucasian lexical connections, which Harmatta interprets as ‘Proto-Iranian’, testifying to the presence of early contacts (ca. 4000 B.C.) between ‘Proto-Iranians’ and speakers of North Caucasian languages. Such facts can be brought into accord with the present book’s claim for a movement of part of the Indo-Iranian tribes from Southwest Asia via the Transcaucasus to the North Caucasus.

The opposite viewpoint, to the effect that the Indo-Iranians moved not northward but southward through the Transcaucasus, receives support in recent publications by Ghirshman (1981 [1977]) and Thomas (1982:64ff.). This trajectory presupposes a Proto-Indo-European homeland in the northern Black Sea and lower Volga areas, with subsequent entry of the Indo-Aryans and Iranians into Southwest Asia via the Transcaucasus and their further movement eastward to their historical territories (see also Bongard-Levin and Grantovskij 1983:155ff.).⁵ We also assume eastward migration to the historical territories, which follows from our hypothesis of an original Indo-European proto-homeland in Southwest Asia. In this respect our hypothesis and those of Ghirshman and Thomas are equally opposed to the view that the Indo-Iranians and Iranians entered their historical territory from the north, from Central Asia. Additional archeological arguments against that viewpoint have recently been adduced (see Sarianidi 1981; cf. Ghirshman 1981). These arguments, together with linguistic and culture-historical ones, point to northward movement of the Iranian-speaking tribes into Central Asia from the southwest (as is also supported by the direction of later migrations of Iranians, up to historical times), rather than the reverse movement from Central Asia to the historical territories in the Iranian plateau and adjacent regions. (See also Tolstova 1984.)

Precisely this latter point of view, favoring an Indo-Iranian entry from the north, a view contradicting the entire complex of linguistic and culture-historical data analyzed in the present study, is advocated by I. M. Diakonoff (1982) in a lengthy paper written, before the appearance of this book, in response to our preliminary publications (Gamkrelidze and Ivanov 1980-1981) (for translations of these papers see Powell ed. 1983). The birch argument (the presence of the word for ‘birch’ in Kafir and Dardic: see II.4.1.2 above, where a reflex of the word for ‘birch’ in Sanskrit as well is pointed out) used by Diakonoff is compatible with our claim for an eastward migration of the Indo-Iranians from Southwest Asia (where the birch is attested paleobotanically). Therefore the birch argument cannot be used unambiguously as evidence for southward movement from Central Asia.

In employing this and similar arguments, Diakonoff is assuming that in order for a word to be preserved the object it refers to must necessarily have been

5. For a survey of earlier literature see Dandamaev and Lukonin 1980:39ff.

present throughout the entire migration route of the tribe in question. But this assumption, also employed by Diakonoff in his later objections to the general picture of migrations of Ancient European dialects across Central Asia, is itself in need of justification and exemplification on concrete linguistic material. Historical examples show that it is not necessarily correct in every instance. From the viewpoint of linguistic theory this is explained by the fact that the linguistic sign need not always be associated with a denotatum as an actually existing object, but can in principle have a *signifié* with no concrete object as denotatum. The fact that the Ancient European languages preserved the word for 'birch' in their migrations from Southwest Asia to Europe via Central Asia is not an argument against this migration route, since a pre-existent word for 'birch' could have been preserved through a transitional period while the speakers of the language were living in territories lacking birches. In such cases the word either continues to express its old meaning, facilitated by preservation of folklore texts (especially mythological) which contain it, or takes on new meanings determined by the new ecological environment (numerous examples of such developments were adduced above in connection with Indo-European plant and animal names). From a linguistic viewpoint it is important that words for 'birch' (and 'elm') which go back to Finno-Ugric were preserved in Hungarian (e.g. *nyírfa* 'birch') during the migration of its speakers from Central Asia (possibly from the region between the lower Volga and the Aral Sea). Since this direction of migration coincides with the earlier migrations we have proposed for speakers of Ancient European dialects of Indo-European, this single comparison with Hungarian is sufficient to reject the counterarguments that have been advanced in connection with the word for 'birch'.

In this connection the word for 'beaver' in Iranian is not without interest. The text of the Avesta, which is assumed to have been composed in Central Asia, preserves mythological and legal conceptions of the role of the beaver as a sacred animal of the goddess Anahita, although the beaver was absent on the banks of the Amu Darya and Syr Darya (see Ghirshman 1981:143; cf. the examples mentioned above showing preservation of the name and mythological significance of the leopard in the Ancient European languages). This testifies yet again to the caution that must be used in approaching the interpretation of connections between word and denotatum and in drawing conclusions on this basis alone, without considering other culture-historical factors, bearing on migration routes of speakers of particular dialects.

We are pleased to note that Diakonoff, who in recent years has begun to use methods analogous to those used here in determining the Afroasiatic homeland based on lexical data (see Diakonoff 1981), has moved away from his earlier uncritical use of the 'beech and salmon' north European homeland for Indo-European and has recently begun to defend the thesis of a Balkan homeland. In this respect he has come closer to our viewpoint, since we place the Balkans in

the broad area, determined by detailed analysis of reconstructed lexical data, that is a first approximation to a zone within which the original Indo-European territory is to be located (see II.11.2.3–11.2.5).

However, our ultimate conclusions exclude the Balkans as an original center of Indo-European diffusion, based on a number of supplementary arguments, primarily linguistic but also culture-historical and archeological. Now, it is precisely the linguistic facts — the borrowed vocabulary uniting Proto-Indo-European with Proto-Semitic and Proto-Kartvelian as well as other languages of Southwest Asia, and testifying to historical contacts among these languages somewhere within Southwest Asia — that Diakonoff rejects. He is particularly hypercritical in assessing the Semitic–Indo-European and Kartvelian–Indo-European lexical correlations, evidently dictated by his preconceived view of the Indo-European homeland, which he presently places in the Balkans. How else are we to evaluate his unwillingness to acknowledge the common origin (due to linguistic contact) of, for instance, PIE **Hasther-* ‘star’ and Semitic **cattar-* ‘deified star’ and a number of other such lexemes (for this set see II.11.3.2 above)? In the general-linguistic theory of borrowing it has long since been established that borrowing from one language to another need not yield an exact reproduction of the sound and meaning of the borrowed word, which are frequently altered under the influence of the borrowing linguistic system and its culture-historical conditions. The connection between the meanings ‘star’ and ‘deified (morning) star’ is so natural for a borrowing that the semantic differences should not, in our opinion, serve as grounds for denying the historical connection of these words. In any case, for each of the Semitic–Indo-European and Kartvelian–Indo-European comparisons analyzed above, at least as many, if not more, formal and semantic arguments can be adduced in its favor as Diakonoff adduces against it. But even if we restrict ourselves to the forms for which Diakonoff does admit a connection (Sum. *urudu* ‘copper’: PIE **reudh-*; Sem. **tawr-* ‘bull’: PIE **thauro-*; Sem. **karn-* ‘horn’: PIE **k̥h̥n-*; Sem. **gady-* ‘kid’: PIE **ghait-*; Sem. **wayn-* ‘wine’: PIE **we/oino-*), there are still enough to force us to assume certain historical contacts among these languages. Reference to an unspecified ‘common third source’ cannot, of course, save the position.

Why do we finally exclude the Balkans, and the range of ancient Balkan culture, as a possible original homeland for the Proto-Indo-European tribes? First of all, archeologically established trajectories for the historical movements of ancient Balkan culture must be taken into account: for the most part they are oriented toward the south. After the fall of the ancient Balkan culture (which had been spread over an area reaching from modern Hungary in the west to the Dniepr in the east in the fourth millennium B.C.), its continuations (especially in metallurgy and systems of written signs) are found in the south of the Balkans

and in the Aegean world, on Crete and the Cyclades (see Gimbutas 1982:17ff.).⁶ There is no movement of this culture to the east of its original boundaries, to the Caucasus and the Volga, where migrations of Indo-Iranians would have to have gone if the Balkans were proposed as the Proto-Indo-European homeland and ancient Balkan culture as the culture of Proto-Indo-European speakers. Nor is there any movement of this culture to western Europe, where the speakers of Ancient European dialects would have brought it if the Balkans had indeed been the Indo-European homeland. Western and Central Europe remained non-Indo-European long after the ancient Balkan culture perished in the fourth millennium B.C., and possibly until the second millennium B.C. when the gradual settlement of Europe by Ancient European dialects and the Indo-Europeanization of Europe began (see also Tovar 1982). It therefore remains unexplained where the Indo-European dialect speakers were located after the fall of the ancient Balkan culture (of which no traces are observed either to the west of this culture or to the east of it), and where the speakers of Ancient European dialects could have come from when they entered Central and Western Europe in the second millennium B.C.⁷

All these chronological, paleogeographic, and culture-historical difficulties are removed if the Proto-Indo-European language is placed somewhere in Southwest Asia and the Ancient European dialect speakers are removed from eastern Europe and the northern Black Sea-Volga-Ural area, where they ended up after migrations via Central Asia. It was from this area that the Ancient European dialect speakers, whose culture can be archeologically correlated with the Kurgan culture, spread to the west. It is the early waves of these migrations that led to the downfall of the ancient Balkan culture in the fourth millennium

6. It can be assumed that this ancient Balkan writing served as a basis for the pre-Indo-European characters used in the Aegean world, specifically for Cretan hieroglyphics and for Linear A, the non-Indo-European nature of whose language is unquestioned by most investigators (see Neumann 1957, Gamkrelidze 1980).

7. It should be noted that the trajectories for movements of the dialect speakers proposed in Diakonoff's article and shown on his maps find no support in archeological, culture-historical, or toponymic materials from the regions in question. In particular, there is nothing to support the hypothetical movement of the Proto-Tocharians and Indo-Iranians from the territory of modern Romania northeastward across the Dnieper.

Even less justified is the placement of speakers of Balto-Slavic, Germanic, Celtic, and Italic in Central Europe, covering it from north to south, as early as the third millennium B.C. (see arrows 2, 3, 4, 5 respectively in Diakonoff's schematic map 2). This, like several other cases, clearly reveals a certain arbitrariness in Diakonoff's models of the Indo-European migrations, which is due to not taking into consideration the most recent archeological and culture-historical data for Eurasia. As for arrow 11 on the same map, indicating a 'Proto-Armenian' movement from central Asia Minor to the east, precisely in this point — which evokes Diakonoff's most polemic ardor — we see no essential departure from the view proposed here, whereby the Proto-Armenians separated from a Greek-Armenian-Aryan dialect grouping which had previously moved westward from the original Indo-European territory. From here the Proto-Armenians, linguistically independent after the separation of the Greeks and Aryans, migrated eastward to their historical territory where they overlaid a Hurrian-Urartean ethnic substratum (see II.12.4 above).

B.C. (see Gimbutas 1982:18ff.) as the Kurgan people gradually entered the Balkans (see Titov 1982:138). Later these tribes spread to the north and west, destroying the megalithic cultures of the original pre-Indo-European inhabitants of Europe, whose traces are preserved only in the extreme western periphery (see Tovar 1982).

Despite the questions which still remain open and will require further investigation and specification (in particular, the archeological lacunae in the territory of Central Asia, especially its deserts and northern regions),⁸ the archeological, culture-historical, and linguistic difficulties that remain on our placement of Proto-Indo-European within Southwest Asia and our account of the dialect migrations prove less critical than the insuperable difficulties, enumerated above, which arise on other solutions to the problem, including the hypothesis of a Balkan proto-homeland for the Indo-Europeans. We hope that further research in this vein will remove the remaining difficulties presented by the hypothesis of an Asiatic proto-homeland for the Indo-Europeans and migratory routes from Southwest Asia to the historical territories on the Eurasian continent.

8. Recent archeological works noting these lacunae express a viewpoint very close to ours. E.g. Krasnov 1980:22: "The most likely point of origin for the food-producing economy in the European and Asian steppe periphery ... is Central Asia, whose cultural influence extended beyond its northern limit and the eastern Caspian region. This influence has so far been observed only in isolated archeological facts because the territory between the Caspian steppe and the northern limit of Central Asia is so weakly studied, but it is real and regular, and can be observed not only for the formative period of the Kurgan Culture but also for later times." Adrianov (1978 and other works on the historical geography of economic types in Central Asia) proposes a movement of cultivated plants and new types of agriculture from the ancient Near East through Central Asia to Europe.

Indo-European and the Indo-Europeans

A Reconstruction and Historical Analysis
of a Proto-Language and a Proto-Culture

Part II

Bibliography, Indexes

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The languages (Indo-European and non-Indo-European) and their written sources

1. Indo-European languages

1.1. Anatolian

The Anatolian languages of ancient Asia Minor — Hittite (written in cuneiform), Luwian (cuneiform and hieroglyphic), and Palaic — are attested in documents from the Boghaz-Köy archive of the second millennium B.C. The oldest Hittite cuneiform texts can be dated by paleographic features (their ancient ductus) to the period of the Old Hittite Kingdom (first half of the second millennium B.C.) and include royal inscriptions: the oldest, that of King Anittas (18th century B.C.: Neu 1974), the Annals of King Hattusilis (17th century B.C.: Imparati 1965), and the Will of King Hattusilis I (Sommer and Falkenstein 1938); there are also historical inscriptions (that of Zukrashi: Otten 1953) and others from KUB and KBo (see Laroche 1971). Also composed in the Old Hittite period is the early variant of the Hittite Laws (Friedrich 1959; Imparati 1964). An archaic form of the language similar to that of Old Hittite is found in many ritual and mythological texts: the Myth of Telepinus (KUB XVII 10; XXXIII), the metrical text about the god Pirwa (Bo 6483: Otten 1951), a burial song (also metrical) (KBo III 46), hymns to the sun (KUB XXI 127-34, XIV 74), a building ritual (KUB XXIX 1), royal burial rituals (Otten 1958), the Prayer of Mursilis II in a Time of Plague (Goetze 1929), and others. Archaic features are also preserved in Middle Hittite texts such as the Text of Madduwattas (Otten 1969): see Heinhold-Krahmer et al. 1979. In the Late Hittite period (14th-13th centuries B.C.), Hittite texts show significant influence from spoken Luwian (for instance, Luwian words marked with the special cuneiform Glossenkeil sign ◀).

Luwian is attested in cuneiform texts, chiefly rituals, of the time of the Hittite Kingdom as well as in later hieroglyphic inscriptions of southern Asia Minor and northern Syria, written in their own hieroglyphic script (Laroche 1960:I; Meriggi 1966-1975).

Palaic is known from fragments, chiefly of mythological and ritual texts, found among the Hittite cuneiform inscriptions (Kammenhuber 1969a).

The later Anatolian languages of Asia Minor are descendants of Hittite and Luwian: these are Lydian and Lycian, attested in alphabetic documents of classical times (Houwink ten Cate 1961, Gusmani 1964, Heubeck 1969, Neumann 1969, Laroche 1974; cf. also Zgusta 1964a).

1.2. Indo-Iranian (Aryan) languages

The earliest evidence of an Indo-Iranian dialect is Mitannian Aryan, attested in the form of Indo-Iranian words and deity names contained in Hittite texts, chiefly texts about the training of horses (Kammenhuber 1961, Mayrhofer 1966).

The oldest actual texts in an Indo-Iranian language are the Old Indic texts of the Rigveda, written down in Indian syllabary in the first millennium B.C. but composed much earlier, probably in the second millennium B.C. The oldest hymns of the Rigveda were probably composed before the entry of Indo-Aryan tribes into northwest India (Aufrecht 1955, Elizarenkova 1972, 1982). The archaic Vedic language that represents the earliest form of Indic is also used in the Atharvaveda (M. Bloomfield 1899, Elizarenkova 1976). The later literary form of the language is often simply called Sanskrit (*saṃskṛta*- 'perfected').¹

Sanskrit literature in the broad sense also includes archaic prose texts of religious and philosophical content, later than the Vedic texts: the Brahmanas and Upanishads (see Van Buitenen 1962, Satya Shrivastava 1977). The ancient juridical tradition is reflected in numerous texts, of which the best known are the Laws of Manu (*Mānava Dharma Śāstra*): see Nārāyaṇ Rām Āchārya 1946. Sanskrit continued to be used as a literary language parallel to the spoken Middle Indic Prakrits from which today's Indo-Aryan languages evolved: Hindi, Bengali, Panjabi, Sindhi, and others (Bloch 1934).

A separate branch of Indo-Iranian is the Kafir, or Nuristani, languages spoken in the mountainous part of Afghanistan (Nuristan, earlier Kafiristan). These are unwritten languages: Kati, Ashkun, Waigali, Prasun (Strand 1973, Grjunberg 1971, 1980; for individual languages see Morgenstierne 1929, 1949, 1954, Fussman 1972). Related to the Kafir languages are the Dardic languages, which fall into two subgroups, Central Dardic (Dameli, Pashai, Gawar-Bati, Shumashti, and others) and Eastern Dardic or Dardic proper (Phalura, Kashmiri, Shina, Garwi, and others): Èdel'man 1965.

The other branch of Indo-Iranian is Iranian, of which Avestan and Old Persian are attested in ancient documents. The hymns of the Avesta, written in Avestan (which has Eastern Iranian dialect traits), were composed in the second and first millennia B.C. but written down in alphabetic writing much later, in the first millennium A.D. The four major parts of the Avesta that have come down to us are the Yasna — which includes the Gathas, hymns attributed to Zarathustra (Humbach 1959) — the Vispered, the Videvdāt (or Vendidad), and the Yashts (hymns), as well as fragments (Geldner 1886-1895). Old Persian, which represents the Western Iranian dialect type, is known from cuneiform documents of the Achaemenid period (6th to 4th centuries B.C.), historical in

1. [Sanskrit citations in this book are largely from Vedic. Hence they are usually identified as simply Sanskrit, abbreviated Skt. — JN.]

content (Herzfeld 1938, Cameron 1951, Brandenstein and Mayrhofer 1964). Median is the language of the Medes (8th to 6th centuries B.C.), reconstructed from individual words (personal names and tribe names) found in Assyrian and Greek sources and in Old Persian inscriptions (see Mayrhofer 1968).

The Middle Iranian languages are divided into eastern and western groups. Eastern Iranian languages include Khotanese Saka (texts of the first millennium B.C. from Central Asia: Bailey 1945-1956, 1951), Sogdian (Benveniste 1940, Henning 1940, Mackenzie 1976, Livšić and Xromov 1981:347-514), Khwarezmian (Frejman 1951), and Bactrian (Humbach 1966-1967, Steblin-Kamenskij 1981:314-16). Western Iranian languages include Middle Persian, or Pehlevi, attested in numerous texts from Sassanid Iran (Henning 1955), and Parthian (texts from Central Asia: Diakonoff and Livšić 1960, Gignoux 1972, Diakonoff and Livšić 1976).

Modern Iranian languages of the eastern group include Ossetic of the Caucasus, with two dialects, Iron (eastern) and Digor (western), considered to be derived from Scythian, which is known from individual words and personal names in the writers of classical antiquity (Abaev 1949); Yagnobi in Central Asia, a direct descendant of Sogdian; Pashto or Afghan; Munji (and its Yidga dialect); and the Pamir languages: Shugni, Rushan (and dialect Khuf: Sokolova 1959), Bartang, Oroshor, Sarikoli, Yazgulami, Ishkashim (and dialect Sanglechi), and Wakhi (see Paxalina 1959, Grjunberg and Steblin-Kamenskij 1976). Western Iranian languages include modern Persian, Tajik, Kurdish, Baluchi, Tat, Talysh, Ormuri, Parachi, and several dialects of central Iran (see Morgenstierne 1929-1938).

1.3. Armenian

Classical Armenian (Grabar) is known from numerous texts going back to the fifth century A.D., including Bible translations and original texts such as the History of Armenia by Moses of Khorene, both of which include fragments of older texts from the prehistoric period of Armenian (Schmitt 1981:215ff.). There are two main groups of Armenian dialects: eastern (in the Transcaucasus) and western (Meillet 1936).

1.4. Greek

The earliest form of an ancient Greek dialect is Mycenaean, known from Cretan and Mycenaean documents in the Linear B script dating to the 15th-13th centuries B.C. (Morpurgo 1963, Ventris and Chadwick 1973). The oldest texts of the next period are the Iliad and the Odyssey of Homer. The main dialects of

ancient Greek are Attic-Ionic (including the Ionic dialects of Asia Minor and the Cyclades as well as Euboean and Attic), Achaeae, including Aeolic and northern Achaeae (Thessalian, Boeotian, and Aeolian of Asia Minor and Lesbos), and southern Achaeae (Arcadian on the Peloponnese, Pamphylian or Cypriot on Cyprus; this dialect is close to Mycenaean); Doric and Northwest Greek (spoken in Laconia, Messenia, the Argolid, the islands of Aegina and Crete and other Aegean islands, and Corinth and Megara). See Buck 1910, Bechtel 1921-1924, Schmitt 1977; also Risch 1979a.

1.5. Phrygian

Phrygian is known from inscriptions from the first half of the first millennium B.C., from northwestern Asia Minor. A few of these are early inscriptions dating back to the seventh century B.C., written in an archaic script similar to the early Greek alphabet; most are later inscriptions of the Roman period, written in the ordinary Greek script of the time (Gusmani 1958, O. Haas 1966, Diakonoff and Neroznak 1977, Neroznak 1978).

1.6. Tocharian

The Tocharian languages are attested in texts from the second half of the first millennium A.D., at the easternmost periphery of Indo-European speech in Eurasia, in Eastern Turkestan [Xinjiang]. There are two languages, conventionally called Tocharian A (East Tocharian) and Tocharian B (West Tocharian). Most of the texts are translations of Sanskrit Buddhist documents, but there are a few original texts: business letters, monastic administrative texts, accounting documents (Sieg and Siegling 1921, 1949-1953, W. Thomas 1964).

1.7. Albanian

Albanian, in the western Balkan peninsula, as attested from the 16th century A.D. There are two main dialects: Geg (northern, in Albania and Kosovo) and Tosk (southern): see Desnickaja 1968, Solta 1980.

1.8. "Ancient European" languages

The term "Ancient European" will be used to include the dialectally and areally related Indo-European languages of Europe from the end of the second millen-

nium B.C. to the beginning of the first millennium B.C. (Krahe 1951, 1954, 1959, 1962).

1.8.1. Italic languages. This is a family of languages of the Apennine Peninsula of ancient times, including the Latin-Faliscan and Osco-Umbrian subgroups, and attested in documents from the first millennium B.C. (Vetter 1953, Solta 1974):

Latin (originally the language of Latium and Rome) and the closely related Faliscan (the dialect of Falerii in southern Etruria) are attested in inscriptions going back to the sixth century B.C., written in a Greek-derived alphabetic script. The oldest Latin is attested in several inscriptions (Ernout 1950:274ff.),² Satumian verse, and the works of early Roman authors (Plautus, Terence).

The Osco-Umbrian subgroup includes the dialects of the Oscans (inscriptions in Samnia and Campania), the Volsci, the Umbrians, and other Sabellian tribes. The most important Umbrian document is the bronze Iguvine tablets (from Iguvium): Poultney 1959, Vetter 1955, Ernout 1961. At the beginning of the present era the Osco-Umbrian languages yielded to Latin.

Venetic. A distinct Indo-European dialect known from brief inscriptions of the fifth to first centuries B.C. in northeastern Italy (Beeler 1949, Krahe 1950, Untermann 1961).

Illyrian. Known from brief Messapic inscriptions from Calabria and Apulia (southern Italy). Illyrian is also known from onomastics of the Italic peninsula, the northwest Balkan peninsula, and adjacent regions (Krahe 1955, Mayer 1957-1959; cf. Tronskij 1953:57-59).

1.8.2. Celtic languages. The Celtic languages fall into two groups: continental Celtic and insular Celtic. On the evidence of Celtiberian inscriptions, speakers of continental Celtic dialects lived in Iberia from the first half of the first millennium B.C. (Lejeune 1955a, Tovar 1961, Untermann 1961a), and in Gaul (modern France) in Roman times, from which there are a number of short inscriptions in Gaulish. Other groups of Celts lived in central Europe: southern and western Germany, the Alpine regions, Pannonia, Italy, and the Balkan peninsula. Insular Celtic, found on the British Isles, includes the Goidelic and Brythonic dialect groups. Goidelic includes Old Irish, attested in Ireland in the Ogam script from the fourth century A.D. and in later texts in the Latin alphabet, as well as Scots Gaelic and Manx. The Brythonic group includes Welsh (Old Welsh is attested in glosses and written documents from the 11th century A.D.), Cornish, and Breton, brought to Brittany by immigrants from Britain in the 5th century A.D. (Old Breton glosses go back to the eighth to eleventh centuries: Jackson 1953).

2. The Praenestine fibula (allegedly from 600 B.C.), formerly considered to be the oldest Latin inscription, has recently been shown to be a forgery created in the 19th century (see Guarducci 1980, Pfister 1983).

1.8.3. Germanic languages. The Germanic languages are usually divided into three groups: Scandinavian (or North Germanic), East Germanic (Gothic), and West Germanic. North and East Germanic are put in a single Gothic-Scandinavian group by some investigators. The earliest attested Scandinavian language — the language of the ancient Scandinavian runic inscriptions — is still close to Proto-Germanic (Makaev 1965). The oldest texts in Old Icelandic (Old Norse) are collected in the Elder Edda (Neckel 1962), a parchment manuscript miscellany of old songs compiled in Iceland in the 13th century but composed much earlier. Old Icelandic also has an extensive prose literature and skaldic poetry. In about the middle of the second millennium A.D. Old Icelandic (Old Scandinavian) split into West Scandinavian (Norwegian and Icelandic) and East Scandinavian (Swedish and Danish) (M. Steblin-Kamenskij 1953).

The primary representative of East Germanic is Gothic, whose oldest document is a Bible translation done by the bishop Wulfila in the 4th century A.D. Gothic was spoken in eastern and southeastern Europe in lands belonging to the Byzantine sphere of influence. There is evidence for the presence of Goths in Byzantium itself, as well as on the Crimea (in the form of a Crimean Gothic word list: Žirnunskij 1964:85-102).

West Germanic (or South Germanic if opposed to a Gothic-Scandinavian branch) includes Old English (or Anglo-Saxon, with texts from the 7th century A.D.), Old Frisian, Old High German (texts from the 8th century A.D.), and Old Saxon (texts from the 9th century), the earliest representative of the Low German dialects. English and Frisian make up an Anglo-Frisian subgroup, opposed to High German dialects, while Low German is intermediate between these two. The earliest poetic texts in West Germanic languages include the Old English epic of Beowulf (Irving 1968, 1969, Wrenn 1973), the Old High German Song of the Nibelung (Körner 1921), and the Old Saxon epic Heliand (Behaghel 1933). The descendants of these languages are modern English, German, Flemish, and Dutch (the latter from Low German dialects).

1.8.4. Baltic languages. There are two groups: West Baltic, represented by Old Prussian (with written texts from Prussia in the 14th-18th centuries A.D.: Mažiulis 1966-1981), which subsequently yielded to German, and East Baltic, including Lithuanian and Latvian (texts go back to the 16th century; see Zinkevičius 1980:I.15-18).

1.8.5. Slavic languages. There are three groups: East Slavic (Russian, Ukrainian, Belorussian, with early documents going back to the 11th century); West Slavic (Polish, Slovian-Kashubian, Czech, Slovak, Sorbian, and extinct Polabian); and South Slavic (Bulgarian, Serbo-Croatian, Slovene, and others), with early texts in Old Church Slavic (translations of Greek texts beginning in

the 11th century A.D.: the Zographensis and Marianus Gospel translations in the Glagolitic alphabet, and in the Cyrillic alphabet the Savvina Kniga of Gospel readings, the Sinai Psalter, the Suprasliensis collection of lives of saints and prophets, and others).

2. Non-Indo-European languages in adjacent parts of Eurasia

2.1. Ancient Near Eastern languages

Hattic. The non-Indo-European language of the indigenous population of northeastern Asia Minor, attested in the form of fragments in Hittite texts. Extinct since the early second millennium B.C. (Kammenhuber 1969).

Sumerian. A non-Indo-European language of Mesopotamia, attested in early pictographic and cuneiform texts going back to the 4th and 3rd millennia B.C. Subsequently yielded to Akkadian. There is evidence for different periods in the history of Sumerian, which point to changes in phonetics and grammatical structure.

Elamite. A non-Indo-European language of southwestern Iran (the mountain valley of the eastern Tigris, modern Khuzistan), with hieroglyphic and cuneiform texts going back to the beginning of the second millennium B.C. Yielded to Old Persian by the first millennium (Diakonoff 1967, Reiner 1969).

Hurrian-Urartean. A non-Indo-European language family, attested from the third to first millennia B.C. in various parts of Southwest Asia: upper Mesopotamia, northern Syria, Asia Minor, the southern Transcaucasus, and northwest Iran. The earliest appearance of the Hurrians in the Near East (specifically, northern Syria) was in the mid-third millennium B.C., at which time in the vicinity of Ebla (modern Tell Mardik) there flourished a powerful Semitic-speaking state with Hurrians as one of its ethnic components. The earliest Hurrian texts date from the second half of the third millennium. The Nawara inscription, from the valley of the Diyala, an eastern tributary of the Tigris, was written in Old Akkadian for the Hurrian king Arižen (or Ari-šen or Atal-šen): see Diakonoff 1967:114, Wilhelm 1982). The oldest Hurrian document in Hurrian proper is an inscription from Urkish in northern Mesopotamia, also written in Old Akkadian cuneiform of the same kind (see Diakonoff 1967:6-7, Haas et al. 1975:24). In the second millennium B.C. there are many Hurrian texts from Mari, Boghaz-Köy, and Ugarit (the latter using two different writing systems: a syllabic logographic type and a consonantal-syllabic one of the ancient Semitic type). Hurrian was the main language of the Mitannian kingdom of Mesopotamia in the mid-second millennium B.C. The El Amarna archive yielded an extensive Hurrian text in the form of a letter from the ruler Tushratta to the Egyptian Pharaoh Amenhotep III from the early 14th century

B.C. (Speiser 1941, Laroche 1978).

A later Hurrian dialect is Urartean of the Kingdom of Van in the southern Transcaucasus, written in Assyrian cuneiform. The texts date to the first half of the first millennium B.C. (Melikišvili 1960, Diakonoff 1971).

2.2. *Semitic languages*

A family of Near Eastern languages attested in written texts from the 2nd millennium B.C.:

East Semitic comprises Akkadian, with Babylonian and Assyrian dialects, spoken in Mesopotamia and adjacent regions. The following stages are distinguished for Akkadian: Old Akkadian (24th-22nd centuries B.C.); Old Babylonian (in southern Mesopotamia) and Old Assyrian (in the middle Tigris and the Cappadocian tablets from Asia Minor), from the beginning of the 2nd millennium B.C.; Middle Babylonian and Middle Assyrian (16th-11th centuries B.C.); Neo-Babylonian and Neo-Assyrian (10th-8th centuries B.C.). The Akkadian inscriptions used a cuneiform script of Sumerian origin, with some changes adapting it to Akkadian dialects.

West Semitic languages from the eastern Mediterranean area (Palestine and Syria). These include the Canaanite subgroup: Paleo-Canaanite or Eblaite (spoken in northern Syria and attested in recently discovered inscriptions from Ebla dated to the mid-third millennium: Pettinato 1975, Gelb 1977); Moabite, represented in one lengthy inscription of the king Mesha (11th century B.C.); Phoenician, with inscriptions beginning in the second half of the second millennium B.C.; (ancient or Biblical) Hebrew, with documents from the end of the second millennium B.C.; and Aramaic, attested in many inscriptions beginning in the first millennium B.C. Several different Aramaic dialects are distinguished: West Aramaic (Nabatean, Palmyrene, Judeo-Palestinian, Samaritan, and others) and East Aramaic (Syriac, Mandaic, and others). The oldest inscriptions in the West Semitic languages are in a linear script of the consonantal-syllabic type going back to an early Semitic prototype.

The Ugaritic language of ancient Ugarit (modern Ras-Shamra, Syria) forms a separate branch within West Semitic. Its texts, dating to the mid-second millennium B.C., are written in a distinct consonantal-syllabic cuneiform.

South Semitic languages include (epigraphic) South Arabian dialects (with texts from the first millennium B.C.); their modern forms Mehri, Shahari, and Soqotri; classical Arabic; Geez (or Classical Ethiopic) and the modern Ethiopic languages Amharic, Tigre, Tigrinya, Harari, and others.

2.3. *Ancient Egyptian*

The language of ancient Egypt, attested in hieroglyphic documents from the end of the fourth millennium B.C. on: Old Egyptian, Middle Egyptian, and Late Egyptian (the latter from the mid-second millennium B.C.). The continuation of Egyptian is Coptic, the language of the Egyptian Christians, written in a script derived from Greek uncial writing; it is an extinct language, preserved only in liturgical contexts. Egyptian, together with Semitic and several language families of Africa — Berber, Cushitic, and Chadic — makes up the Afroasiatic family (see M. Cohen 1947, Diakonoff 1965, 1975).

2.4. *Caucasian (or Paleo-Caucasian) languages*

Kartvelian languages. This is a language family of the southern Caucasus, consisting of four related languages: Georgian (with texts going back to the fifth century A.D.), Mingrelian, Laz (or Chan), and Svan.

Abkhaz-Adyghe (Northwest Caucasian). Languages of the northwestern Caucasus, including Abkhaz (with Abaza), Adyghe, Kabardian, and Ubykh.

Nakh-Daghestanian (Northeast Caucasian). Languages of the eastern Caucasus. There are two branches. The Daghestanian branch consists of the Avar-Andi-Tsez group (Avar, Andi, Botlikh, Godoberi, Karati, Akhvakh, Bagvali, Tindi, Chamali, Tsez, Khvarshi, Ginukh, Bezhta, Hunzib); the Lezghian group (Lezghi, Tabassaran, Agul, Rutul, Tsakhur, Archi, Kryz, Budukh, Xinalug, Udi); Lak; and Dargi. The Nakh branch consists of Chechen, Ingush, and Batsbi (or Tsova-Tush).

2.5. *Dravidian languages*

This is a family of 23 languages spoken for the most part in the southern Indian subcontinent. There are seven major languages: Telugu, Tamil, Kannada, Malayalam, Gondi, Kurukh, and Tulu. Tamil, Telugu, Kannada, and Malayalam have written traditions going back to the beginning of this era. Before the arrival of the Indo-Aryans in India the Dravidian languages were spoken over most of the Indian subcontinent, including the northwestern part; they were displaced by Indic, with which they were in contact for a long period (see Burrow and Emeneau 1961).

2.6. *Munda languages*

A group of languages spoken in India (chiefly its central part) and forming a branch of Austroasiatic, a large family of mostly Southeast Asian languages.

2.7. *Uralic languages*

A family with two branches, Finno-Ugric and Samoyedic. The Finno-Ugric languages are divided into Ugric (Hungarian in central Europe, and Ostyak and Vogul [also sometimes known as Khanty and Mansi] in western Siberia) and Finnic, the latter with subgroups: Finno-Permic (Komi [or Permiak and Zyrian] and Votyak [Udmurt]); Balto-Finnic (Finnish, Veps, Vote, Estonian, Livonian, and others in northeastern Europe); Volgaic (Moksha Mordvin, Erzia Mordvin, Hill Cheremis [Mari], and Meadow Cheremis [Mari]); and Lapp [Saami]. See Hajdú 1975.

2.8. *Altaic languages*

Many scholars group the Turkic, Mongolian, and Tungusic languages together as Altaic.

The Turkic languages are attested in written texts from western Siberia (the Yenisei-Orkhon inscriptions) and Central Asia dating to the seventh century A.D. and written in a Turkic runic script derived from Sogdian (Kononov 1980) and reflecting the Old Turkic (or Old Uigur) language. Turkic languages fall into several subgroups: Chuvash; Southwest or Oghuz Turkic; Northwest or Kipchak; Kirghiz-Altay; and Southeastern (Uigur).

The Mongolian languages include Mongol proper as well as Buriat, Kalmyk, and others such as Oirat, Dagur, and Monguor.

The Tungusic languages include Manchurian and Jurchen (the Manchurian or southern branch) and Evenki, Even, Negidal, Solon, and the languages of the Amur subgroup (the Tungus or northern branch).

2.9. *Paleoasiatic (Paleosiberian) languages*

This is a grouping of genetically unrelated languages of indigenous ethnic minorities of Siberia. Four language families are included in Paleoasiatic: Chukchi-Kamchatkan, Eskimo-Aleut, Yukagir, and Ket-Assan (Yeniseian). The latter group includes several languages of western Siberia extinct since the 17th

to 19th centuries (Kott, Arin, Assan, and others) as well as Ket, spoken on the middle and upper Yenisei.

Also included in Paleoasiatic is the language isolate Nivkh (Gilyak).

2.10. Chinese

Chinese is attested in texts written in pictographic script from the second millennium B.C. The oldest texts come from northern and central China. The phonetic forms of Old Chinese words have been reconstructed by comparative analysis of the modern dialects and analysis of words borrowed into other Asian languages — Japanese, Korean, Vietnamese, and others (Karlgren 1940). Old Chinese forms are cited in the transcription of Karlgren 1923, 1940. Modern Chinese forms are in *pinyin*.

The territory of Chinese speech forms the easternmost limit of the non-Indo-European languages which have come into contact with Indo-European dialects in the course of the Indo-European migrations.

Transliteration of languages with non-Latin writing systems

In this work, examples from languages with their own traditional scripts are usually cited not in phonetic transcription (unless explicitly indicated) but in Latin transliteration with some additional diacritics and special symbols. The transliteration systems used are generally standard ones for the languages concerned. When necessary, the phonetic content of transliteration symbols for ancient languages is described below in terms of the phonetic and phonological status of the phonemes they represent. Aspiration of voiceless stops, where not indicated in standard transliteration, is described in this section.

Hittite and other Anatolian languages

The transliteration system for Hittite and the other Anatolian languages (Luwian, Palaic) is a one-to-one system rendering each syllabic sign of the cuneiform (or, for Luwian, hieroglyphic) script with the standard combination of Latin letters used in Assyriology (for Hittite see Friedrich 1960), each sign set off by hyphens. In addition, standard unhyphenated transliteration is also used: thus *akkanteš* or *kuenzi* in addition to *ak-ka-an-te-eš* or *ku-en-zi*. This unhyphenated transliteration makes no claim to phonetic or phonological accuracy but is used for economy and convenience.³ Thus, for example, the cuneiform symbols for *š* and *z* in Hittite render [s] and [ts], but will be transliterated here as *š* and *z*. Actual phonetic properties of Hittite sounds will occasionally be explicitly indicated by phonetic or phonemic transcription in square or slant brackets.

Mycenean and classical Greek

Transcriptions of Mycenaean Greek inscriptions, either syllabic or unhyphenated, follow standard practice for rendering Linear B (see Morpurgo 1963, Ventris and Chadwick 1973). Classical Greek is transliterated in standard fashion, except that citations of long verse passages have been left in the original alphabet.

3. It has recently been established that plene writing (or doubling of vowels) represents word stress in Hittite, so that forms such as *e-eš-zi*, *a-ša-a-an-zi*, *pa-ta-a-na*, etc. are to be interpreted phonetically as having not length but stress, i.e. *étsi*, *asántsi*, *patán* (see Hart 1980, Carruba 1981). In unhyphenated writing the accent is not indicated (unless otherwise noted), nor is the vowel doubling indicated with a macron (as in *ēszi*, *asānzi*, *parāna*).

Sanskrit

Vedic and other Sanskrit forms are cited in the standard transliteration (see Renou 1930, Mayrhofer 1953). The Old Indic writing system (*devanagari*) was a syllabic one organized by phonetic and morphological paradigmatics of the sounds:

Short syllabics: *a, i, u, ṛ, (l)*
 Long syllabics: *ā, ī, ū, ṝ, (l̄)*
 Vowels: *e, o* (functionally, these are diphthongs with short first elements: **ai, *au*)
 Diphthongs with long first element: *ai, au* (functionally, **āi, *āu*)
 Non-syllabic sonorants: *y, v, r, (l)*
 Stops:

	Voiceless	Voiceless aspirate	Voiced	Voiced aspirate	Nasal
Palatal	<i>c</i>	<i>ch</i>	<i>j</i>	<i>jh</i>	<i>ñ</i>
Velar	<i>k</i>	<i>kh</i>	<i>g</i>	<i>gh</i>	<i>ṇ</i>
Cerebral (retroflex)	<i>ṭ</i>	<i>ṭh</i>	<i>ḍ</i>	<i>ḍh</i>	<i>ṇ</i>
Dental	<i>t</i>	<i>th</i>	<i>d</i>	<i>dh</i>	<i>n</i>
Labial	<i>p</i>	<i>ph</i>	<i>b</i>	<i>bh</i>	<i>m</i>

Sibilants: *s, ṣ* (cerebral), *ś* (palatal)

Aspiration: voiced spirant *h* and voiceless *ḥ* (*visarga*), an allophone of *s* in word-final position. The nasal vowel *anusvāra* is indicated with *m̄*.

Palatal affricates: *c, ch, j, jh* are compact (hushing) sounds, phonetically *č* (= [tʃ]), *ḥ* (= [dʒ]), etc.

Tocharian

Tocharian texts are written in Indic script and transliterated as for Sanskrit, with the addition of *ā*, a distinct front vowel, and *ts* for [ts].

Avestan, Old Persian, and other Iranian languages

Avestan is written in a script derived from Aramaic-Pehlevi with some additions and changes, and is cited in a normalized standard transliteration (see Reichelt 1909, Morgenstierne 1942):

Vowels:	<i>a, ā, i, ī, u, ū, e, ē, o, ō, ā, ă</i>
Reduced vowels:	<i>ə, ē</i>
Nasal vowel:	<i>ą</i>
Stops:	
Labial:	<i>p, b</i>
Dental:	<i>t</i> (<i>t</i> word-finally in certain positions), <i>d</i>
Velar:	<i>k, g</i>
Spirants:	
Labial <i>f, w</i> ; dental <i>θ, δ</i> ; velar <i>x, xʷ, ɣ</i>	
Sibilants:	
Hissing <i>s, z</i> ; compact (hushing) <i>š⁴, ž, ʒ</i>	
Aspiration:	<i>h</i> (corresponding to several different signs) ⁵
Affricates:	compact (hushing) <i>č, ʃ</i>
Sonorants:	
Nasal:	<i>m, n, ŋ, (ŋ̃)</i>
Oral:	<i>y, v, r</i>

A simpler transliteration system is standard for Old Persian, which was written in syllabic cuneiform (see Kent 1953, Brandenstein and Mayrhofer 1964):

Vowels:	<i>a, ā, i, ī, u, ū</i>
Stops:	<i>b, d, g</i>
	<i>p, t, k</i>
Affricates:	<i>ʃ, č</i>
Spirants:	<i>v, f</i>
	<i>β</i>
	<i>z, s</i>
	<i>š, ʒ</i>
	<i>h̥</i>
Aspiration:	<i>h</i>
Sonorants:	<i>m, n, y, r</i>

Forms from Middle Iranian dialects such as Sogdian, written in a consonantal script derived from Aramaic, are transliterated without vocalism.

4. This symbol renders several signs of the Avestan script. According to Morgenstierne, they correspond to three distinct phonemes: */š/, /šʷ/, /ʃ/*.

5. In addition to *h* there is also a sign for a palatalized variant *hʷ*.

Classical Armenian

The transliteration system used here is that of Meillet 1936, 1937, 1938:45, with some later corrections in the aspirated affricates (Schmitt 1972, 1981):

Stops:

Voiceless: *p, t, k*
 Voiceless aspirated: *p', t', k'*
 Voiced: *b, d, g*

Affricates:

Voiceless: *c, č*
 Voiceless aspirated: *c', č'*
 Voiced: *j (= [dz]), ʝ (= [dʒ])*

The phonological opposition of voiceless unaspirated to voiceless aspirated affricates is best understood not as an opposition like that of Indic *č* to *čʰ* but as an opposition of glottalized (unaspirated) to unglottalized (aspirated), like that of *c'* to *c* or *č'* to *č* in Caucasian languages.

There are distinct letters for two types of non-nasal sonorants: *l* and *ł* (the latter velarized), and *r* and *ř* (the latter a trill which can be interpreted as long or geminate: see Bolognesi 1962, Schmitt 1972:303). *ē* transliterates a closed vowel reflecting a former diphthong and found only in stressed syllables; *ə* is a short tense vowel found in unstressed syllables.

Gothic and other Germanic languages

The Gothic writing system, based on late Greek uncial script, is transliterated with Latin letters and some additional characters: *þ*, a voiceless dental or interdental spirant (like English [θ]), *q* for the labiovelar stop [k^o], and *h* for the labialized fricative [h^o]. [w] and [j] are transliterated *w* and *j*. The same symbols are used for transliterating runic letters, with *R* indicating a voiced spirant similar to a vibrant.

In Icelandic orthography, the acute accent marks vowel length: e.g. *y* indicates [ū]. The fricatives [β] and [ð] (and in Old English also [θ]) are written with the barred letters *þ* and *ð* (or *ð*).

In Old High German, *z* indicates the affricate [ts].

Slavic languages

Old Church Slavic forms, whether originally written in Glagolitic or Cyrillic, as well as words from modern Slavic languages written in Cyrillic (Russian, Belorussian, Ukrainian, Bulgarian), are written in standard academic transliteration: *y* is a high central or back unrounded vowel, *ě* an open or low front vowel, *ī* and *ŭ* short (or reduced) high vowels (where these letters, known as *jers*, are retained in later orthographies including Old Russian, they are transliterated with single and double apostrophes: ' and "); *ǫ* and *ę* are nasalized vowels; *c* is [ts], *č* is [tʃ], and *x* is the voiceless velar fricative. The modern jotated vowels are transliterated with letter sequences: *ja*, *ju*.

Italic languages

The Italic languages Faliscan, Oscan, and Umbrian, together with other ancient languages of Italy including Messapic and Venetic, are transliterated with ordinary Latin script (in which *c* indicates [k] and *u* indicates [w]). Oscan *í* and *ú*, with acute accent, indicate [e] and [o].

Old Irish

Irish words written in Latin letters are spelled as in the original. The combination *th* indicates a voiceless dental spirant [θ], and *ch* is voiceless velar [x]. Vowel length is shown by an acute accent: *é*, *ó*, etc.

Kartvelian languages

Words from Kartvelian languages are transliterated as follows, with the apostrophe marking glottalization. Voiceless stops are aspirated, but this is not indicated in transliteration.

Stops and affricates:

	Voiced	Voiceless (aspirated)	Glottalized
Labial	<i>b</i>	<i>p</i>	<i>p'</i>
Dental	<i>d</i>	<i>t</i>	<i>t'</i>
Velar	<i>g</i>	<i>k</i>	<i>k'</i>
Postvelar	—	<i>q</i>	<i>q'</i>
Alveolar	<i>ʒ</i>	<i>c</i>	<i>c'</i>
Palatal	<i>ʒ̣</i>	<i>č</i>	<i>č'</i>

Fricatives:

Alveolar	<i>z</i>	<i>s</i>
Palatal	<i>ʒ</i>	<i>ʃ</i>
Velar	<i>ɣ</i>	<i>x</i>

Semitic languages

Words from Semitic languages are transliterated using the standard system of Latin letters with some additional marks and letters.

Laryngeals and pharyngeals:	<i>ʾ</i>	<i>ʿ</i>
	<i>h</i>	<i>ḥ</i>

Stops (followed by their fricative variants):

	Voiced	Voiceless	Emphatic
Labial	<i>b / ḅ</i>	<i>p / p̣</i>	— (<i>ḥ</i>)
Dental	<i>d / ḍ</i>	<i>t / ṭ</i>	<i>ḍ</i> <i>ṭ</i>
Velar	<i>g / ḡ</i>	<i>k / ḳ</i>	<i>ḳ</i>

Fricatives:

Alveolar	<i>z</i>	<i>s</i>	<i>ʒ</i>	<i>ʃ</i>
		<i>ʃ̣</i>		
		<i>ʒ̣</i>		
Interdental	<i>ḏ</i>	<i>ṯ</i>	<i>ḏ̣</i>	<i>ṯ̣</i>
Velar	<i>ɣ (ḡ)</i>	<i>x (ḫ)</i>		
Labial	<i>(v)</i>	<i>f</i>		

Sonorants: *r, l, m, n*

Semivowels: *w, y*

Affricates: *ǧ* *č*

Vowels:

Short	<i>a</i>	<i>e</i>	<i>i</i>	<i>o</i>	<i>u</i>
Long	<i>ā (ā)</i>	<i>ē</i>	<i>î (î)</i>	<i>ô</i>	<i>û (û)</i>
Extra-short	<i>ạ</i>	<i>ẹ</i>		<i>ọ</i>	

Abbreviations

Languages and dialects

Abkh.	Abkhaz	ELith.	Eastern Lithuanian
Aeol.	Aeolic (Greek)	Engl.	English
A. Eur	Ancient European	Est.	Estonian
Akk., Akkad.	Akkadian	Etr.	Etruscan
Alb.	Albanian	Falisc.	Faliscan
Arab.	Arabic	Fi-U	Finno-Ugric
Aram.	Aramaic	Finn.	Finnish
Arc.-Cypr.	Arcado-Cyprian	Finno-Perm.	Finno-Permian
Arm.	Armenian	Finno-Volg.	Finno-Volgaic
Assyr.	Assyrian	Finno-Volg.-Perm.	Finno-Volgaic-Permian
Att.	Attic		
Av., Avest.	Avestan	Fr.	French
Bashk.	Bashkir	Gaul.	Gaulish
Boeot.	Boeotian	Geo., Georg.	Georgian
Bret.	Breton	Ger.	German
Buddh. Sogd.	Buddhist Sogdian	Gk.	Greek
Bulg.	Bulgarian	Gmc.	Germanic
Burm.	Burmese	Goth.	Gothic
Celt.	Celtic	Hatt.	Hattic
Ch.	Chechen	Hebr.	Hebrew (Biblical)
Chin.	Chinese	Hier. Luw.	Hieroglyphic Luwian
ChSl.	Church Slavic		
Chuv.	Chuvash	Hitt.	Hittite
Cl., Class.	Classical	Hom.	Homeric (Greek)
ClMong.	Classical Mongolian	Hung.	Hungarian
Copt.	Coptic	Hurr.	Hurrian
Corn.	Cornish	I.	Ingush
Cret.	Cretan	Icel.	Icelandic
Crim. Goth.	Crimean Gothic	IE	Indo-European
Cypr.	Cypriot	Illyr.	Illyrian
Cz.	Czech	Indo-Iran.	Indo-Iranian
Dan.	Danish	Ion.	Ionian (Greek)
dial.	dialectal, dialect	Ir.	Irish
Dor.	Doric	Iran.	Iranian
Eg., Egypt.	Egyptian	Ital.	Italic
Elam.	Elamite		

Jap.	Japanese	O	Old (followed by language name)
Kabard.	Kabardian		
Kartv.	Kartvelian	OBret.	Old Breton
Kashub.	Kashubian	OBurm.	Old Burmese
Kirgh.	Kirghiz	OChin.	Old Chinese
Komi-Zyr.	Komi-Zyrian (Zyrian)	OCorn.	Old Cornish
Kurd.	Kurdish	OCS	Old Church Slavonic
L	Low(er) (followed by language name)	OCz.	Old Czech
Lat.	Latin	OE	Old English
Latv.	Latvian	OFal.	Old Faliscan
LGer.	Low German	OFr.	Old French
Ligur.	Ligurian	OFris.	Old Frisian
Lith.	Lithuanian	OGeorg.	Old Georgian
Liv.	Livonian	OHG	Old High German
LSorb.	Lower Sorbian	OHitt.	Old Hittite
Luw.	Luwian	OIcel.	Old Icelandic
Lyc.	Lycian	OIr.	Old Irish
Lyd.	Lydian	OIran.	Old Iranian
M	Middle (followed by language name)	OLat.	Old Latin
Maced.	Macedonian (of classical times)	OLG	Old Low German
Manich. Sogd.	Manichean Sogdian	OLith.	Old Lithuanian
MBret.	Middle Breton	OMaced.	Old Macedonian
MCom.	Middle Cornish	ONorse	Old Norse
MDutch	Middle Dutch	ONorw.	Old Norwegian
ME	Middle English	OPers.	Old Persian
Messap.	Messapic	OPhyrg.	Old Phrygian
MGk.	Middle Greek	OPol.	Old Polish
MHG	Middle High German	OPruss.	Old Prussian
Ming.	Mingrelian	ORuss.	Old Russian
MIr.	Middle Irish	OSax.	Old Saxon
MLG	Middle Low German	Osc.	Oscan
mod.	modern	Oss.	Ossetic
Mong.	Mongolian	OSwed.	Old Swedish
Mordv.	Mordvin	OTib.	Old Tibetan
MParth.	Middle Parthian	OTurk.	Old Turkic
MPers.	Middle Persian	OUkr.	Old Ukrainian
MWelsh	Middle Welsh	OWelsh	Old Welsh
Myc.	Mycenean Greek	Pal.	Palaic
Norw.	Norwegian	Pamph.	Pamphylian
		Parth.	Parthian
		Pehl.	Pehlevi
		Perm.	Permian

Pers.	Persian	Toch.	Tocharian
Phoen.	Phoenician	Toch. A	Tocharian A
Phryg.	Phrygian	Toch. B	Tocharian B
PIE	Proto-Indo-European	Turco-Bulg.	Bulgar Turkic
Pol.	Polish	Turk.	Turkish
Polab.	Polabian	Tyrol.	Tyrolean
Prak.	Prakrit	Ugar., Ugarit.	Ugaritic
RChSl.	Russian Church Slavic	Ukr.	Ukrainian
Rum.	Rumanian	Umbr.	Umbrian
Russ.	Russian	Ur., Urart.	Urartean
S.Arab.	South Arabian	USorb.	Upper Sorbian
Sem.	Semitic	Uzb.	Uzbek
Serbo-Cr.	Serbo-Croatian	Ved.	Vedic
Skt.	Sanskrit	Venet.	Venetic
Slav.	Slavic	VLat.	Vulgar Latin
Sogd.	Sogdian	Volg.-Perm.	Volgaic-Permian
Sum.	Sumerian	Volsc.	Volscian
Swed.	Swedish	WGk.	West Greek
Syrac.	Syracusan	WOsset.	West Ossetic
Thess.	Thessalian	WSem.	West Semitic
Thrac.	Thracian	Yazg.	Yazgulami
Tkc.	Turkic		

Grammatical terms

A	active	imper.	imperative
abl.	ablative	imperf.	imperfect
acc.	accusative case	In	inactive
Ad	addressee	inf.	infinitive
adj.	adjective	instr.	instrumental case
aor.	aorist	intrans.	intransitive
C	consonant	loc.	locative case
caus.	causative	masc.	masculine
cond.	conditional	neut.	neuter
D	voiced stop	nom.	nominative case
D	designee	NP	noun phrase
dat.	dative	O	object
du.	dual	opt.	optative
fem.	feminine	p	preverb/adposition
gen.	genitive case	p.	person (e.g. 2p. =
H	laryngeal		second person)

pass.	passive	T	voiceless stop
perf.	perfect	trans.	transitive
pers.	personal	V	vowel
pl.	plural	V	predicate, verb
ppl.	participle	VM	version marker
pres.	present	voc.	vocative case
pret.	preterite	VP	verb phrase
R	sonorant, resonant	1	first person (e.g. 1sg. = first-person singular)
S	subject	2	second person (e.g. 2pl. = second-person plural)
s.th.	'something' (in English glosses)	3	third person (e.g. 3du. = third- person dual)
sg.	singular		
S _{Intr}	subject of intransitive verb		
S _{Tr}	subject of transitive verb		

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Hittite Laws	Hittite Laws (Friedrich 1959)
ABoT	<i>Ankara Arkeoloji Müzesinde bulunan Boğazköy Tabletleri.</i> Istanbul, 1948
Aeschyl. <i>Prom.</i>	Aeschylus, <i>Prometheus</i>
Al.	<i>Der Vertrag des Muwatalliš mit Alakšanduš von Wiluša.</i> J. Friedrich, <i>Mitteilungen der Vorderasiatisch-Aegyptischen Gesellschaft</i> 34:1. Leipzig, 1930
AM	<i>Die Annalen des Muršiliš</i> (Goetze 1933)
Assur	Hieroglyphic Luwian inscription from Assur (Laroche 1960:XXX)
AV	<i>Atharvavedasamhitā</i> (Bloomfield 1899)
Bo	Unveröffentlichte Texte aus Boğazköy. 1. Bo (followed by text number) = Funde von 1906-1912, Istanbul. 2. Bo (followed by year number and text number) = neue Funde, beginnend mit Bo 68/1, Ankara
BoSt	<i>Boghazköi-Studien</i> , Leipzig 1916-1924
BoTU	<i>Die Boghazköi-Texte in Umschrift.</i> E. Forrer, Wissenschaftliche Veröffentlichungen der Deutschen Orientgesellschaft, Leipzig, 1922, 1926
C.A.	Cippus Abellanus (Buck 1905:126ff.)
Carchemish	Hieroglyphic Luwian inscription from Carchemish (Laroche 1960:XXV-XXVI)
Cic. <i>Sen.</i>	Cicero, <i>Post reditum in Senatu.</i> Cicero: <i>The Speeches.</i> The Loeb Classical Library, 48-99
Festus	S. P. Festus, <i>De verborum significatu quae supersunt</i>
H.	Haðōxt Nask (Avesta)
HAB	<i>Die hethitisch-akkadische Bilingue des Hattušili I</i> (Labarna II). (Sommer and Falkenstein 1938)
Hatt.	<i>Hattušiliš. Der Bericht über seine Thronbesteigung nebst Paralleltexten.</i> A. Goetze, <i>Mitteilungen der Vorderasiatisch-Aegyptischen Gesellschaft</i> 29:3. Leipzig, 1925
Herodotus, <i>Hist.</i>	Herodotus, <i>Historiae</i>
Hesychius	Hesychius Alexandrinus, <i>Lexicon</i>
Hipponax	<i>Les fragments du poète Hipponax. Études et Commentaires,</i> 43. Ed. O. Masson, Paris 1962
HT	<i>Hittite Texts in the Cuneiform Character from Tablets in the British Museum.</i> London, 1920

IBoT	<i>Istanbul Arkeoloji Müzelerinde bulunan Boğazköy Tabletleri(nden Seçme Metinler) I-III.</i> Istanbul, 1944, 1947, 1954
Karatepe	<i>Phoenician-hieroglyphic bilingual from Karatepe</i> (Laroche 1960:XXV)
KBo	<i>Keilschrifttexte aus Boghazköi I-VI.</i> Wissenschaftliche Veröffentlichungen der Deutschen Orientgesellschaft, 30, 36. Leipzig 1916-1923; Berlin, 1954-
KUB	<i>Keilschrifturkunden aus Boghazköi.</i> Berlin, 1921-
Madd.	<i>Madduwattaš.</i> A. Goetze, <i>Mitteilungen der Vorderasiatisch-Aegyptischen Gesellschaft</i> 32:1. Leipzig, 1928
MS	<i>Muršilis Sprachlähmung</i> (Goetze and Pedersen 1934)
Pausanias	Pausanias, <i>Graeciae descriptio</i>
Pestgebete	<i>Die Pestgebete des Muršiliš.</i> A. Goetze, <i>Kleinasiatische Forschungen</i> , 161-251 (1929)
Plaut., <i>Truc.</i>	Plautus, <i>Truculentus</i> . The Loeb Classical Library, V
Pud.	Le voeu de Puduḫepa. E. Laroche, <i>Revue d'Assyriologie et d'Archéologie Orientale</i> 43:55-78 (1949)
PY	Pylos Tablets (Bennett 1955)
RV	<i>Ṛgvedasamhitā</i> (Aufrecht 1955)
Supr.	<i>Suprasl'skaja rukopis'. Pamjatniki staroslavjanskogo jazyka</i> 2:1, ed. S. Sever'janov. St. Petersburg, 1904
T.B.	Tabula Bantina (Buck 1905:130ff.)
T.I.	Iguvine Tables (Poultney 1959)
Tel.	Telepinus myth (KUB XVII 10; KUB XXXIII 1-10); Order of King Telepinus (BoTU 23 A, B, C = KBo III 1 + KBo XII 5 + KBo III 68 + KBo XII 7)
Tun(n).	<i>The Hittite Ritual of Tunnawi.</i> A. Goetze, American Oriental Series 14. New Haven, 1938
UKN	Urartean cuneiform inscription (Melikišvili 1960)
Ull.	<i>The Song of Ullikummi</i> (Güterbock 1951-1952)
VBoT	<i>Verstreute Boghazköi-Texte</i> , hrsg. von A. Goetze, Marburg, 1930
Vd	Vidēvdāt (Avesta)
Y	Yasna (Avesta)
Yt	Yašt (Avesta)

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